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RENAL INFECTIONS*

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THE subject of renal infection, interesting as it is, is much too complicated to be discussed comprehensively in one brief hour. A thorough presentation of any one of half a dozen aspects of the problem would consume the allotted time. The route by which infection reaches the kidney, the types of infection found, the underlying pathology, the methods of treatment which have been employed, special types of infection, such as those of childhood or those occurring in pregnancy,—any one of these subjects would in itself provide sufficient material for a paper. It has seemed best to treat the subject this evening in the manner of a clinical lecture, describing the various types of renal infection, exclusive of tuberculosis, as I have seen them, and illustrating different groups of infections by abstracts of case histories.

In general, I would divide renal infections into those which are simple or primary, and those which are probably initiated, and certainly kept up, by some other pathological condition in the urinary tract. Primary renal infections may be dependent upon conditions outside the urinary tract, such as infected tonsils or teeth, or colitis, or some factor which lowers the resistance of the patient, such as anemia. For example, pyelonephritis frequently accompanies pernicious anemia or the leukemias, and is often the immediate cause of death in these cases. Within the past ten years pyelitis due to these conditions has been seen much less frequently, owing to the more extensive use of routine blood examinations and of transfusions, and to the introduction of liver extract.

In spite of the general improvement in the medical care of patients, acute primary renal infections are still common. They occurred in my cases three times as frequently in women as in men; the explanation of this phenomenon is not clear, but I do not believe it can be accounted for by the greater frequency of constipation or movable kidney in the female. Symptomatically, the great majority of these infections begin with cystitis; this may clear up entirely within a few days, leaving a sterile urine, or renal infection may develop, manifested by renal pain and tenderness and a temperature elevation of at least three degrees. Uncomplicated cystitis may cause a fever of one or two degrees, but higher temperatures than this always mean, I believe, that the infection has involved the upper urinary tract. The fact that these infections occur so much more frequently in women than in men suggests that the different conformation of the lower urinary tract is the important factor; in other words, it points to an ascending infection as the method of bacterial invasion. The occurrence of cystitis and often pyelitis following deflorescence supports this hypothesis.

The corresponding type of renal infection in men is frequently complicated by prostatitis; whether the prostatic infection is primary or secondary to the renal infection is difficult to prove, but since we often find non-specific prostatitis existing without pyelitis, we have here some support for the hypothesis that the infection is an ascending one.

The method by which bacteria ascend from the lower tract to the kidneys is not clear. Years ago Sweet and Stewart demonstrated that bacteria could pass upwards along the ureter by the lymphatic route; this hypothesis has been denied by some investigators on the basis that the lymphatics of the ureter are segmented. Sakata[8] and Bauereisen[1] showed that there are lymphatics in the muscular coat of the ureter, running parallel with the blood vessels; Hundley[6], in commenting upon their findings, points out that the blood supply of the upper ureter is different from the blood supply of the lower segment, and infers that the lymphatics may not communicate. We may believe that ascent by way of the lymphatics is possible, but has not been proved with certainty.

Another possible method of ascent is by way of the ureteral lumen. It has been shown many times that fluid cannot be forced up normal ureters by increasing intravesical pressure, but a number of investigators have demonstrated that a vesico-ureteral reflux may occur under certain conditions. Kretschmer[7] has shown by means of cystograms that this occurs in normal children; Semblinow demonstrated this in animals in 1883, and Wislocki and O'Conor[11] and Roger Graves[5] have done the same. Graves states

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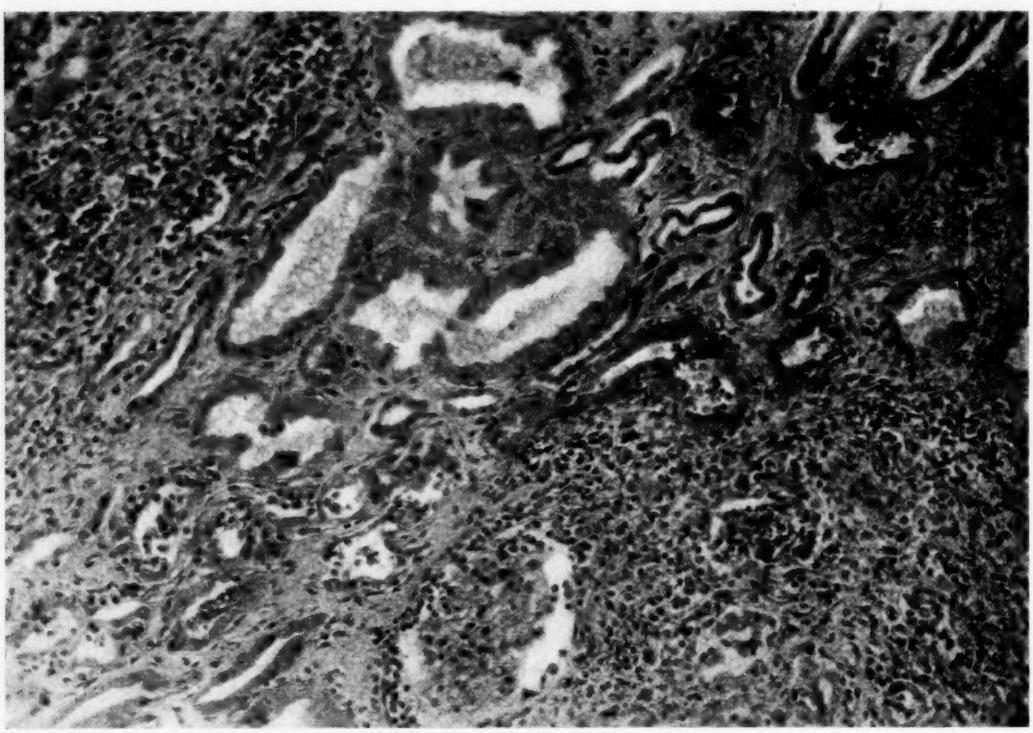

FIG. 1. Pyelonephritis. This section shows the round-cell infiltration of the cortex. Some of the glomeruli are invaded.

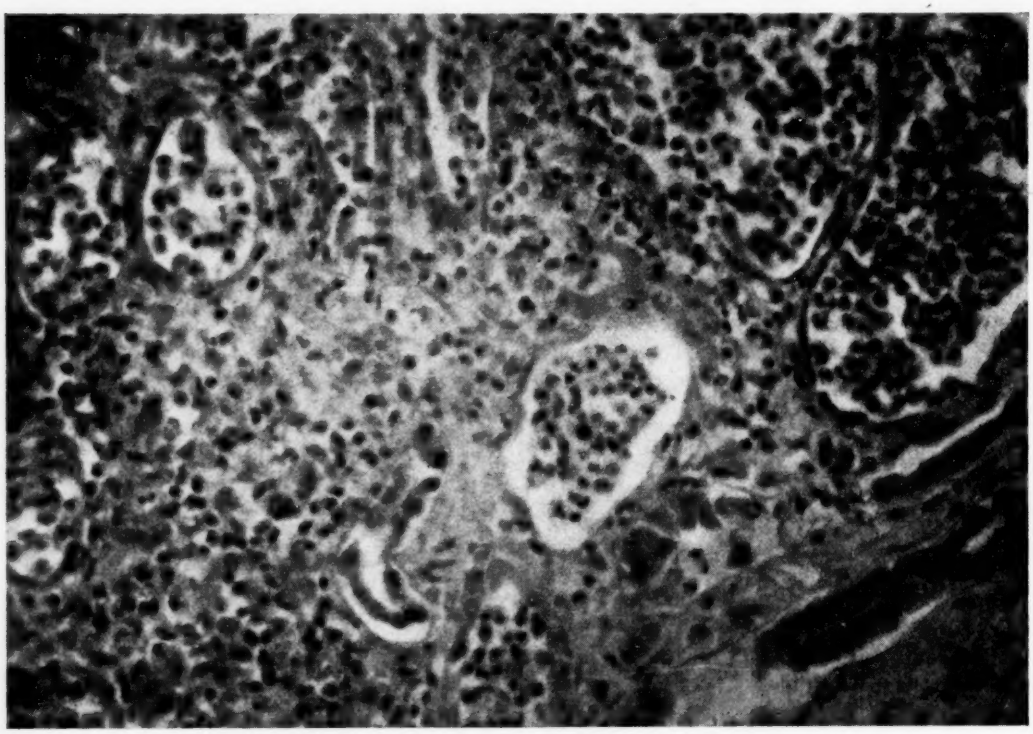

FIG. 2. Higher power microphotograph of an area in the section shown in figure 1.

that reflux is due not to the degree of bladder distension but to a state of tonic contraction of the bladder muscle which causes sufficient rise in the intravesical pressure to force the bladder contents up the ureter when the ureteral orifice opens to emit a jet of urine. It would seem not unlikely that this condition might occur during an attack of acute cystitis, when the bladder is in a state of increased tonicity. It is not uncommon, during an attack of acute pyelitis, to have the second kidney flare up a few days after the first, as is evidenced by a sudden recrudescence of fever and tenderness, this time over the second kidney; this occurs during acute infections much oftener than during chronic infections. Pyelitis also may follow the cystitis caused by catheterization, when we may be fairly sure that it is an ascending infection.

The bacteria which are found in these cases are almost always of the colon group. The question whether their activity is limited to the renal pelvis (pyelitis) or whether they invade the parenchyma (pyelonephritis) seems to me to be answered by the incidence of high temperature, tenderness and often enlargement of the kidney. These could not be caused by inflammation of the pelvis alone. It seems probable that during the acute stage of a so-called pyelitis, the renal parenchyma is always more or less affected. (Figs. 1 and 2.) As the attack subsides, the kidney itself throws off the infection, but the pelvic mucosa, especially if it is not perfectly drained, continues to harbor bacteria. If this were not the case, lavage of the renal pelvis would not clear up these infections as we know it often does. The temporary depression of renal function is shown by a lessened output of phenolsulphonephthalein, as well as by the retention of nitrogen if the process is bilateral. Such a condition was illustrated by the case of Mrs. S., a woman of thirty-six, who gave a history of occasional attacks of "cystitis" since she was twelve. She entered the hospital with a nonprotein nitrogen of ninety-nine milligrams; she vomited everything and had constant headaches. Bloody urine was obtained from the left kidney, clear from the right. Both staphylococci and streptococci were grown from the left kidney specimen. Pyelograms showed a slight degree of hydronephrosis on the right, but no obstruction on the left. Intravenous saline and glucose were given for several days; the nonprotein nitrogen fell rapidly to twenty-eight, and her urine cleared completely.

The usual attack of pyelonephritis of the primary type is accompanied by a sudden marked rise of temperature, 104° or 105° Fahrenheit being not unusual. The pulse rate, however, does not show a corresponding increase, and the patient does not seem so sick as such a high fever would warrant. There may be vomiting and distension; sometimes there is considerable renal pain, but often only localized tenderness. With proper treatment, or frequently with none, the temperature falls by lysis within three to five days. Severe pain suggests obstruction to drainage from stone, ureteral kink or stricture, or perhaps only from masses of thick pus.

As the acuteness of the infection subsides, the temperature returns to normal and the renal tenderness and enlargement disappear. The urine is likely to remain cloudy for a week at least, usually for much longer. In many cases the pus disappears from the urine, but a bacilluria continues indefinitely unless measures are taken to clear it up. This bacilluria, I believe, is at the bottom of most of the cases of recurring pyelitis; between attacks, the patient, particularly if a woman, suffers from frequent, painful urination. Cystoscopy shows a normal appearing bladder except for perhaps some reddening or bullous edema of the trigone; there may be polyps at the bladder outlet, and the urethral mucosa shows a patchy redness. These symptoms can usually be relieved by urethral dilatation and lavage, but will be cleared up much more rapidly if the urinary infection can be controlled. These cases are so common in the practice of all of us that I will not take the time to present examples.

There is another, much rarer type of primary renal infection. This is the so-called acute hematogenous kidney described by Brewer, Cotton, Cunningham[3] and others. The invading organism is the staphylococcus and sometimes the streptococcus pyogenes. That it is brought to the kidney by the blood stream is obvious, for it may be metastatic from an infection on the surface of the body, such as a furuncle or carbuncle. The bacteria are probably lodged in the capillary tuft of a glomerulus, as tubercle bacilli have been seen to do by Medlar and Gilbert Thomas. The lesion therefore is in the cortex, often close beneath the capsule. It is believed by some that almost all perinephric abscesses begin in this way, but I am not sure that this is always the case. These blood-borne lesions in the kidney may be of various types; they may consist of a single lesion, the so-called renal carbuncle, or of multiple miliary abscesses. The latter are often found at autopsy in cases dying of renal infection. They may be of various degrees of acuteness, ranging from the fulminating infection to one of weeks' or even months' duration. The picture differs from that of colon bacillus pyelonephritis in that the patient is more toxic, the pulse more rapid, and the local tenderness very much greater. There may be so much spasm of the abdominal muscles that in a right-sided infection the diagnosis of appendicitis is sometimes made. To add to the difficulty in diagnosis, the urine often contains no pus or blood.

I do not remember having seen an acute case of this type for many years. Two cases of the

subacute variety have come under my care in recent years. One, a man of fifty-three, entered the Baker Memorial with a history of one attack of pyuria occurring ten months before, which apparently cleared up. Four weeks before entrance his present attack began with frequent, burning urination, fever, cough and dull pain in the left flank. He had vomited occasionally and had lost ten pounds in weight. Examination showed a sick looking man; in the left flank and left upper abdomen was a smooth, slightly tender mass the right edge of which reached the umbilicus. His white count was something over 20,000; the urine was loaded with pus. Urine from the right kidney showed no pus, that from the left contained twelve leucocytes per field and some clumps. Pyelograms showed some dilatation of the left ureter and evidence of pressure on the calyces. Left nephrectomy was done; the perirenal fat was infiltrated and the kidney showed two abscesses in the lower pole and one in the upper. The cut surface was studded with abscesses ranging from three to eight millimeters in diameter. Culture showed the staphylococcus aureus. Aside from some suppuration of the wound, recovery was uneventful, and three months later his urine was normal.

The other case was a woman who entered the Massachusetts General Hospital with a temperature of 105° and pulse rate of 130. For three weeks she had had pain in the left flank and abdomen. One week before this pain began she had boils on the left arm; she had chills and fever and general malaise. Pyelograms showed a filling defect in the left kidney. At operation, a carbuncle of the kidney was found; it was about three inches in diameter and occupied the middle third of the kidney. As there appeared to be a line of cleavage between the carbuncle and the surrounding renal tissue, the inflammatory mass was enucleated and the cavity packed with gauze. Although there was some sepsis in the wound, the patient was discharged one month later. Two months later her urine still contained pus.

Let us take up again the colon bacillus pyelonephritis, this time of the subacute or chronic type. These are the cases in which there is usually some cause for the persistence of the infection. Renal stone should always be considered and ruled out by x-ray; I have seen a number of cases of persistent pyuria due to calculus with no history of pain or bleeding.

The relation existing between mobility of the kidney and pyelitis is well recognized. If such kidneys become infected, there are two factors which militate against recovery. The dragging down of the kidney upon the renal vein may produce a passive congestion of the kidney, and the drainage from the renal pelvis may be hindered by the kinking of the ureter caused by descent of the kidney. It is worth noting, however, that one sees many of these very movable kidneys which escape infection.

An ectopic kidney, with its artery and vein abnormally situated, and its ureter liable to all sorts of distortion, is very subject to infection.

FIG. 3. Pyelogram of a case of pyelitis in a woman with unilateral double kidney and ureter.

Other congenital anomalies predispose to infection, perhaps because the drainage is imperfect. There were five cases of unilateral double kidney in the series of two hundred and fifty renal infections upon which this paper is based, but in most of the cases, the infection involved the

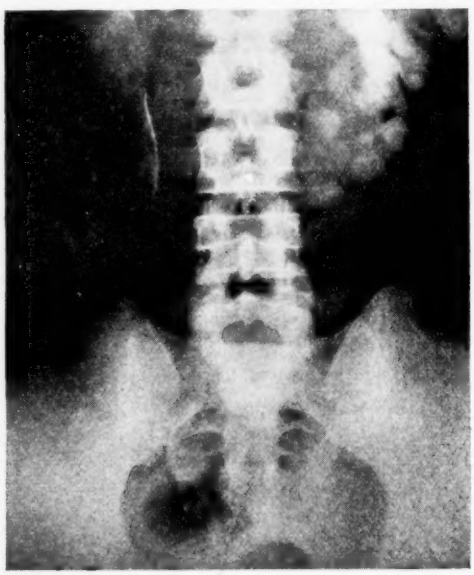

FIG. 4. Horseshoe kidney, with infection in the right pelvis. The left side has been transformed into a large, calcified cyst.

normal kidney as well as the abnormal one. (Fig. 3.)

Horseshoe kidney is another condition which carries the liability to infection, as has been shown so well by Gutierrez in his monograph on

this anomaly. The accompanying pyelogram (fig. 4) shows a very interesting case in which the left half consisted of a huge calcified hydronephrosis; the right half was definitely infected. Removal of the hydronephrotic half produced no apparent improvement in the right-sided infection, although it was thought that freeing the right side and allowing it to fall into

FIG. 5. Calcified cyst removed from patient whose pyelogram is shown in figure 4.

a more normal situation might improve the drainage.

Obstruction to drainage may involve a single calyx only. I have pyelograms of two such cases to show you. One was a girl of twenty-one who, following an operation for appendicitis, had left pyelitis. Since then, a period of fifteen months, she had suffered from backache, painful urination and some urinary leakage. The urine showed a few leucocytes and the colon bacillus. Pyelograms showed a small cystic cavity communicating with the pelvis of the left kidney. At operation this cyst was found to be a dilated calyx, the neck of which was stenosed to a pinpoint opening. This cyst was opened, the membrane lining it electrocoagulated, and a pack left in. The patient's symptoms were relieved and one month after operation the urine was sterile.

A similar case to this, but more advanced, occurred in a woman of forty-nine who three weeks before being seen had experienced sharp pain in the left flank, accompanied by fever and nausea. After two weeks in bed she seemed well again, but a sharp recurrence of her pain brought her to me. Pyelograms (fig. 6) showed a good-sized cavity in the middle third of the left kidney, and thick pus containing colon bacilli from that side. Nephrectomy was done. The perinephric fat was indurated; in the middle of the kidney was a thick-walled, smooth cavity containing about one ounce of thick pus. It communicated with the pelvis by a very small orifice and probably represented a dilated calyx. Microscopic examination showed the cortex and medulla filled with fluid exudate and wandering cells. "Chronic suppurative nephritis."

The next site for obstruction is at the ureteropelvic junction. I could show you a number of illustrations of this, but one or two will suffice. It is unreasonable to expect that a hydronephrosis, once infected, will ever clear up unless the drainage can be materially improved. Here are two illustrations of this condition, one slight, the other advanced. The former is a woman (fig. 7) of forty-eight, who six years

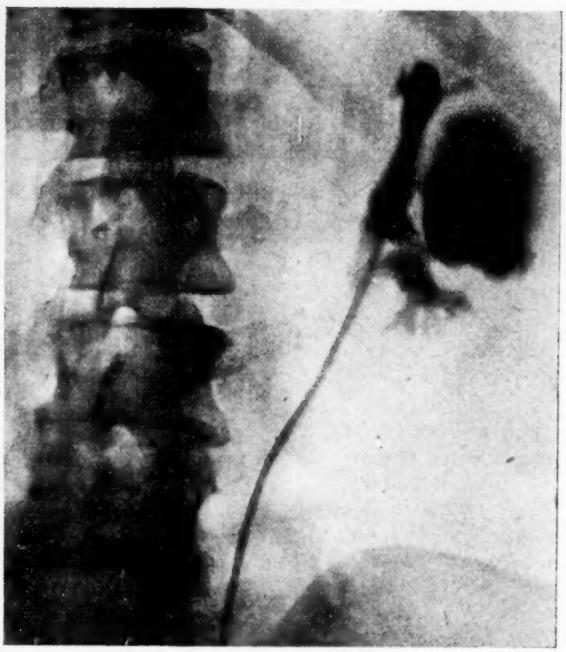

FIG. 6. Pyelogram showing an abscess of the middle calyx.

ago had a stone removed from the right kidney. Within the past year she has had several attacks of pyelonephritis and between attacks the urine clears up except for the presence of colon bacilli. Pyelograms showed a definite extrarenal hydronephrosis of the right kidney. For the past six months she has been free of acute attacks and has had very few symptoms referable to her urinary condition. Comparison of pyelograms made a year ago and again recently show no increase in the hydronephrosis. Because she is not considered an excellent operative risk and because of the lack of symptoms, operation at the present time does not seem advisable.

The more advanced case is that of a man of sixty. In 1925 he was found to have a marked hydronephrosis with considerable damage of the kidney tissue on the right side and a totally destroyed pyonephrotic kidney on the left. I

did a plastic operation on the pelvis of the right kidney; there was a large aberrant artery which was the cause of the obstruction at the ureteropelvic junction and to avoid cutting this I separated the ureter from the pelvis and carried it to the other side of the aberrant artery. A month later I removed the left kidney. This

FIG. 7. Pyelogram showing first degree hydronephrosis, with mild but persistent infection and no diminution in renal function.

patient did well for seven years, then he began to have attacks of pyelonephritis, owing to increasing obstruction at the ureteropelvic junction. A permanent nephrostomy was done and since that time he has been free from further attacks.

Any condition in the ureter which interferes with adequate drainage of the kidney may be a factor in keeping up an infection. Ureteral kinks, although much discussed a few years ago, seem to have lost some of their prestige as troublemakers. They are usually associated with nephroptosis, so that the responsibility for the renal infection has to be divided between them. Unless the ureter is fixed at the point of flexion and is dilated above this point, I doubt if we should be too concerned about these kinks.

Ureteral stones are a frequent cause of renal infection, although it is remarkable that many cases in which the stone causes sufficient obstruction to produce dilatation show no infection unless bacteria are introduced by prolonged or too vigorous manipulation. With the removal of the stone the infection usually clears up, except in a few cases in which pyelonephritis has existed for so long a time that the renal parenchyma has become permanently damaged.

Strictures of the ureter have been alleged by some writers, notably Hunner, to be one of the most frequent causes of renal infections. With this view I cannot agree. There are in normal ureters variations in the calibre of the lumen, the tract being narrowed physiologically at the ureteropelvic junction and at the entrance

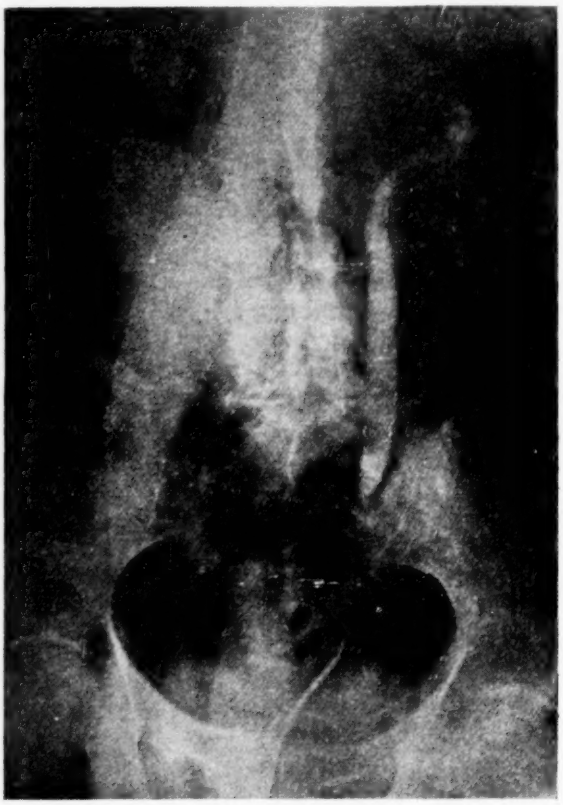

FIG. 8. Ureteral stricture.

into the bladder. A stricture, strictly speaking, is a constriction caused by scar tissue and round cell infiltration, and should be demonstrable at autopsy. The fact that an eight or nine French bulb does not pass with equal facility through the entire length of the ureter does not, in my opinion, necessarily indicate the existence of a stricture. True strictures do exist, of course; I have found fourteen records of cases that I have seen. Ten of these were in women and were caused by pelvic inflammation in one, cancer of the ovary in one, cancer of the cervix in two; one followed ureterolithotomy, another

followed radium treatment of a carcinoma of the uterus. (Fig. 8.) Another was due to tuberculosis, the opposite kidney having been removed for this disease. In three the etiology was unknown. Four were in men, and all were of unknown etiology. The striking thing about these strictures was that occasional dilatation, every two, four or even six months, kept the patient perfectly comfortable and in most cases free of infection. Three of the men appeared to have soft strictures which were cured by one or two dilatations; one of these when seen seven years later had been perfectly well. In two of them, hematuria was the predominating symptom. One of the women was cured by a plastic operation on the upper ureter, in which there was a spindle-shaped stricture several centimeters in length; another required nephrectomy for pyelonephritis. In a third, nephrostomy was done and the ureter dilated from above, with relief of pain and infection.

Another form of ureteral stricture is the condition known as megaloureter, in which the ureter is dilated from the bladder wall to the renal pelvis. In these cases that I have seen the ureter admits a number six catheter easily, and there is no evidence of constriction in the intramural portion, but immediately outside the bladder the ureter is markedly dilated and atonic. This condition is sometimes found in children, and has been thought by some to be congenital; it is sometimes bilateral. In one of my cases there was no infection; in another both kidneys were seriously damaged. One woman required nephroureterectomy.

Obstruction to drainage of the upper urinary tract due to conditions at the bladder neck is common. The damage done to kidneys by a combination of back pressure and infection is best shown in prostatics. Renal infection may follow any condition which prevents complete emptying of the bladder, such as cystocele, multiple sclerosis, tabes dorsalis, and urethral stricture.

The extent of the damage done to kidneys by chronic infection is variable; without doubt it depends largely upon the coincident obstruction to drainage. You have all seen patients with chronic pyelitis whose kidneys appear to function perfectly after years of pyuria. Occasionally a case is seen in whom the infection has resulted in a definitely lowered renal function even though no evidence of obstruction can be found.

The slow progress of these chronic renal infections is illustrated by one of the first patients that I had. In 1911 he was a boy of twenty-two who came to me because of a urethritis. As his urine did not clear up, I investigated his upper urinary tract. The left ureter I could not catheterize, but the function of the left kidney as tested by indigo carmine was very poor. The right kidney was hydronephrotic, with a capacity of seventy cubic centimeters. The total phthalein test showed an appearance time of one hour; in two hours only 20 per cent was excreted. This was before the introduction of pyelography, but the diagnosis of right hydronephrosis, at that time uninfected, was clear. There was no way of determining the condition of the left kidney; guinea pigs were negative for tuberculosis. I saw the patient intermittently until 1914; although I advised operation on his right kidney, he steadfastly refused. In 1926 he came in again complaining of occasional pain in the right flank and cloudy urine. He had married, and had felt well for the preceding four years. I advised further study, but again he shied off. In 1930, almost twenty years after I first saw him, he again appeared. Aside from having had an attack of shingles he had been well. Neither kidney was palpable. He had no residuum in the bladder, his blood pressure was 140/100; the urine was very cloudy, full of pus, with a specific gravity of 1.010 and a large trace of albumin. His nonprotein nitrogen was eighty milligrams per hundred cubic centimeters of blood. This time I was less enthusiastic in advising study or possible operation; at any rate, he refused further investigation.

The study of such cases as this has been greatly aided by intravenous urography. If we had had this method in 1911, the condition of the right kidney could have been easily ascertained. As regards the left kidney, I doubt if our knowledge of its condition could have been materially increased, for when a kidney will not excrete phthalein in fair concentration, neither will it excrete the intravenous medium. Intravenous pyelography is valuable up to a certain point; it will show whether a kidney is normal as to function and pelvic conformation, but during the more acute phases of renal infection, or if the kidney drainage is obstructed to a considerable degree, there may be no visible excretion of the medium.

This has been shown a number of times in our cases, and we have frequently found that the inability of a kidney to excrete the pyelographic medium does not necessarily mean that it is a worthless kidney.

In all such cases, and indeed in the vast majority of cases showing any evidence of upper tract pathology, we have supplemented intravenous pyelography by cystoscopy and retrograde catheterization of the ureters. I will not consider the diagnosis of the numerous types of pathology which are associated with infections of the kidneys; urologists are familiar with these, and they can be made with certainty only by means of the urologist's skill and urological tools. The point I wish to emphasize is this: all cases of persistent hematuria or pyuria should be subjected to a thorough urological investigation.

The treatment of renal infection divides naturally into two phases, one dealing with acute infections, and one with chronic. In the acute stage, treatment consists largely in standing by and giving the patient a chance. The vast majority of these cases are self-limited; all that the doctor needs to do is to reassure the patient, see that he gets at least one hundred ounces of fluid every twenty-four hours, intravenously if necessary, and insure adequate bowel action. If there is much pain, a plain x-ray of the urinary tract is advisable, for if a ureteral stone is at the bottom of the trouble, it should be got after at once. Heat over the affected kidney is soothing; the administration of alkalies increases diuresis and alleviates the dysuria which so often exists.

I have had no experience with the use of pituitrin, as advised by Darley and Draper[4]; it is said to hasten recovery by increasing the tone of the muscle of the pelvis and ureter. The use of methenamine intravenously, thirty-one grains (two grams) once or twice a day, has appeared to help in bringing about a rapid fall in temperature. If methenamine is used, of course the alkalies should not be employed, and to be logical one should not force fluids to any great extent. It has seemed better to me to rely upon alkalies and diuresis during the first two or three days of an acute pyelonephritis, changing to methenamine and acidification of the urine as the patient's condition begins to improve. After all, most of these acute cases will quiet down no matter what form of therapy is employed, so long as they have sufficient fluids.

If the acute attack does not show signs of subsiding within four or five days, one should suspect that he is dealing with something more than a simple pyelonephritis. If the kidney is definitely enlarged and tender and is getting more so every day, the ureter should be catheterized to rule out obstruction. The catheter may be left in for a day or so, provided this gives relief. If no obstruction is found, the question of surgical exploration should be seriously considered. Nephrectomy may be necessary in the fulminating cases of acute suppurative nephritis; in less acute cases decapsulation or nephrostomy may be adequate.

If the acute attack subsides, but the urine continues to be cloudy, internal medication should be given a thorough trial. In my experience, methenamine, either orally or intravenously, has been the most effective drug when the infecting organism is the colon bacillus. Since it is not split up into formaldehyde and ammonia except in a strongly acid urine, the fluid intake should be reduced to sixty ounces per day and the urine acidified by ammonium chloride. At least sixty grains of the latter should be given every twenty-four hours; the enteric coated tablets of seven and one half grains each may be used, or the plain tablets of five grains each taken with at least four ounces of water. I usually give fifteen grains of methenamine every eight hours; the twenty-four hour amount should be at least forty-five grains. If the urine cannot be acidified, or if methenamine proves too irritating for the bladder, methylene blue in two grain tablets given three times a day has sometimes acted effectively. In the coccus infections, sandalwood oil, perhaps combined with methylene blue, alleviates bladder discomfort and seems to inhibit bacterial activity to some degree. None of the other drugs commonly used for this condition have seemed to me as effective as those mentioned in the preceding paragraph.

If, after a week or two of internal medication, the urine does not appear to be clearing, pelvic lavage with 1 per cent mercurochrome or 1 per cent silver nitrate may be done. I hesitate to cystoscope a patient who is in the acute phase of renal infection unless there is a definite indication for it; the risk of traumatizing an acutely inflamed mucous membrane and the fatigue induced in the patient to my mind outweigh the advantages of the procedure. In the subsiding or chronic phase, however, the situation is altogether different. The drug used is not important; I have seen many a pelvic infection clear up after pyelography with 12.5 per cent sodium iodide.

The use of vaccines, at one time so popular, seems to have been abandoned by most urologists. The intradermal injection of a bouillon filtrate, introduced by Vincent O'Conor, at first report appeared to be of value, but this method did not fulfill its promise. It may be that further work along this line will turn up something of value; the most that could be accomplished by vaccines, I believe, would be the development of an individual's resistance to recurring attacks of pyelonephritis; the local infection in the renal pelvis will in all probability not be greatly affected. In combination with pelvic lavage, however, vaccines may have a limited value.

The ketogenic diet appears more promising; reports of its use, especially in children, have been encouraging. It consists, as you know, in the administration of a diet rich in fat and low in carbohydrates. Ketone bodies are excreted in the urine and apparently have a definite bactericidal value. The patient cannot be kept on this diet for more than two weeks, as acidosis develops. This method would seem to have its greatest usefulness in those cases of persistent bacilluria in whom no obstructive lesion can be demonstrated. My own experience with it is too limited to be of value. I have used it in two cases, but as both showed slight obstruction to renal drainage on one side or the other, it is not remarkable that the results were unsatisfactory.

There has not been time to discuss the special varieties of renal infection, such as those occurring in children and in pregnancy or the puerperium. The therapeutic principles are the same; forced fluids and alkalies during the acute stage, active attack on the infection by means of internal urinary antiseptics and pelvic lavage during the subacute stage, diligent search for the obstructive lesion if the infection does not clear up. The work of Bugbee and of Campbell has taught us that persistent urinary infections in children are in all probability due to underlying congenital anomalies or to stone; Crabtree and Prather have shown that dilatation of the upper urinary tract is usual in pregnancy, and that this dilatation persists for three months after delivery. In these cases the value of pelvic lavage is undoubted, as dilatation of the lower end of the ureter promotes drainage from the dilated upper ureter and renal pelvis.

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THE TRANSPLANTATION OF UNINJURED TUMOR CELLS*

BY OLIVE GATES, M.D., AND SHIELDS WARREN, M.D.†

WHILE in most work with experimental tumors the use of small masses of tissue or emulsions of cells for transplantation is satisfactory, there are instances where the ability to obtain uninjured cells is of great importance. Any process of grinding, shredding, or mincing of the tumor necessarily causes a considerable degree of cellular injury, and if very small doses of tumor emulsions are used, the presence of any viable cells is open to question.

Apparently the value of the use of peritoneal fluid from cases of experimentally induced carcinomatosis peritonei has not been widely recognized. In 1927 Hesse[1], working with the Flexner-Jobling rat carcinoma, found in the course of a study of the peritoneal lesions that the tumor could be transmitted by intraperitoneal injection of ascitic fluid containing the tumor cells. The character of these peritoneal fluids was further studied by Koch[2], who noted that the cells present were usually single, floating free in the fluid. Loewenthal and Jahn[3] showed that intraperitoneal injection of Ehrlich mouse carcinoma produced a similar fluid which could be utilized for inoculation, and emphasized the small dosage capable of initiating a tumor. Collier[4] injected this Ehrlich mouse ascitic fluid not only intraperitoneally, but intrapleurally, intracranially, and intravenously. With the intravenous injections he obtained no evidence of pulmonary metastasis, as determined by inoculation of material from the lungs into other mice.

In the course of our studies on the mechanism of pulmonary metastasis we attempted reproduction of the picture seen in pulmonary metastases in human beings by intravenous injection into rats of various types of emulsion of the Walker carcinoma 256. The high proportion of traumatized cells in emulsions prepared by grinding or screening led us to the use of fluid from cases of induced carcinomatosis peritoneii.

The initial lesion is produced by the implantation of a mass of tumor tissue weighing 0.05 Gm. or less free in the peritoneal cavity. At the end of 15 or 20 days most animals develop marked evidence of ascites, and exploration reveals the peritoneum studded with tumor nodules and filled with a thin, bloody fluid, often 20 cc. or more in amount. This fluid is used as the inoculant. The cells occur in it largely singly, but with scattered clumps running up to 10 or 15 cells also present. By the use of 1 per cent acetic acid to hemolyze the red cells an accurate count of the tumor cells may be made with a hemocytometer. They can be readily distinguished by their morphology from the mesothelial cells of the peritoneum. All the cells seen are apparently viable. Counts range from 60,000 cells or clusters per c. mm. upward. The intravenous injection of varying amounts of this exudate produces massive pulmonary metastases, leading to the death of the animal in 15 to 20 days. The immediate mortality following intravenous injection of this fluid is much lower than in the case of the usual tumor emulsions. Other methods of inoculation of the peritoneal fluid (intraportal,

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intratesticular, etc.) appear equally successful.

The advantages of this method are obvious. First, an accurate count of the number of cells present can be made. All the cells present are apparently viable. The fluid is easily handled and the tumor cells remain viable in it for considerable periods. It is of low toxicity and large doses are tolerated. If desired that only single cells be injected, a light centrifugalization will remove the cell clumps. By appropriate dilution any desired dosage of uninjured single tumor cells may be fairly readily obtained.

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THE DIETARY MANAGEMENT OF DIABETICS AT THE DIABETIC CLINIC OF THE INFANTS' AND CHILDREN'S HOSPITALS, BOSTON, MASS.*

BY ALLAN M. BUTLER, M.D.†

OVER the past five or six years very little has been added to our knowledge of the abnormal physiology of diabetes which as yet can be turned to clinical use, and no advances have been made in specific therapy. There has, however, been an accumulation of clinical experience which has led to a general acceptance of certain facts which may be used to the patient's advantage.

(1) Almost all children with diabetes.—that is, children presenting the symptoms of polyuria, polydipsia, loss of weight, fatigue, and having glycosuria, ketonuria, hyperglycemia, and a diabetic blood sugar curve,—require insulin if their physical condition is to be such as to permit their leading normal lives.

(2) Because of Allen's[1] pre-insulin experience with sub-maintenance diets and the relation of obesity to diabetes, diets of excessive caloric value should be avoided.

(3) The use of low carbohydrate, low protein, and high fat diets such as used by Newburgh and Marsh[2] and Petrén[3] before the introduction of insulin but which are modified to provide for adequate growth and development do not reduce the number of insulin injections required per day, and thus the use of these diets seems no longer necessary.

(4) There are certain advantages in a liberal carbohydrate diet and no demonstrable contraindications. The advantages are as follows: (a) The blood fat and cholesterol are kept within normal limits. Joslin[4] believes this is important in preventing certain of the complicating sequelae of diabetes. (b) The child eats food more nearly like that of others about him and the temptation to take food outside of that prescribed is less. These two results are of psychological importance. (c) With the onset of an infection the dietary management is easier on the liberal carbohydrate diet than on the high fat diet, inasmuch as the carbohydrates are usually well taken and are sufficient with the continuation of the insulin to prevent ketosis and acidosis.

(5) Diabetic children usually do better when showing a trace of sugar than when on a régime that renders their twenty-four hour urine specimen continuously sugar free. The latter result usually cannot be accomplished without subjecting the child to either an unwarranted number of insulin injections or periods of hypoglycemia, and in so far as is known the occasional appearance of sugar in the urine is not harmful.

These clinical observations have led to a steady increase in the carbohydrate content of diabetic diets over the past nine years until now there are but few clinics prescribing less than 175 grams of carbohydrate per day per adult patient.

In addition to these generally accepted facts, experience in the care of 116 diabetic infants and children over the past nine years in the out-patient department of the Infants' and Children's Hospitals has led us to certain beliefs.

(1) The need for insulin in the diabetic child is so general that we see no advantage in attempting to initiate treatment without insulin.

(2) No information of use in the subsequent care of the patient is gained by attempting to determine a patient's tolerance at the beginning of treatment, for the tolerance at this time is often more dependent upon the previous régime, the presence of infection, or the nutritional and nervous state of the patient, than upon the true severity of the diabetes.

(3) No increase in the ultimate tolerance of the patient is obtained by placing the patient on sub-maintenance diets for a period of time.

If these clinical observations and the conclusions therefrom are sound, the dietary man-

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agement of the diabetic can be reduced to a relatively simple task and hospitalization of untreated or improperly treated diabetic infants and children can be reduced markedly below that which commonly obtains.

The increased allowance of carbohydrate reduces the percentage variation of inaccuracies and makes accurate weighing of the diet unnecessary. No matter how carefully diets are weighed out, estimations from food tables permit only rough approximations of the carbohydrate, protein, fat and total calories actually consumed. By eliminating foods very high in carbohydrate and putting definite maximum limits to the amount of certain foods fairly high in carbohydrate we have found it unnecessary to specify the size of helpings of all but a few foods. The dietary instructions to all our diabetics over two years of age* are as follows:

(a) Eat no candy, cakes, cookies, jams or sugar, and no desserts to which such ingredients have been added in any considerable amount.

(b) Eat but one piece of bread a meal or its equivalent in crackers.

(c) Have at one meal only one of the following: rice, macaroni or potato, and of the one take only one moderate helping.

(d) Eat but half a banana or apple at any one time.

(e) In the middle of the morning take some form of food containing between 10 and 20 grams of carbohydrate. If at any time symptoms of hypoglycemia appear, the juice of one orange or some food containing 10 grams of glucose is to be taken immediately.

(f) Except for these instructions eat as desired at mealtime provided ordinary common sense is applied in not stuffing on any particular dish.

On such a régime, insulin is given in sufficient amounts and appropriate distribution to render the patient almost sugar free and free from hypoglycemic periods. Having specified the diet as given above, the successful administration of insulin in terms of avoiding hyper- and hypoglycemic periods and of a minimum number of injections is the physician's technical task.

The reason for specifying mid-morning carbohydrate is to permit the giving of a relatively large proportion of the twenty-four hour insulin dosage before breakfast without the danger of an insulin reaction late in the morning before lunch. By this means children four years of age or over may be given large enough doses of insulin before breakfast so that most of them will require no insulin before lunch and many of them will require no insulin throughout the remainder of the twenty-four hours. After the twenty-four hour requirement of insulin has been established and the child has built up its glycogen stores, the optimum number and time of the injections are determined. If the total twenty-four hour dose of insulin for a child over four years is 12 units or less, a single injection before breakfast should be tried. If the twenty-four hour dose is above 12 units and under 30 an injection before breakfast and one before supper are usually required and suffice. In older children twenty-four hour doses up to 50 units can be divided into two such doses with success. The before breakfast dose should be the larger of the two. If more than two doses in twenty-four hours are required, the third dose should be given before dinner or at 9:00 P.M. Trial will determine which is the best period. In contrast to older children, infants or small children usually require three daily injections of insulin even when the twenty-four hour dosage is small, as they are subject to rapid fluctuations in blood sugar concentration.

In estimating the success of insulin administration careful observations of the amount of sugar in single and twenty-four hour urine specimens indicate the times and degree of hyperglycemia, but do not indicate fluctuations of the blood sugar below desirable limits. To check the degree of hypoglycemia, blood sugar determinations at the periods of anticipated hypoglycemia are helpful. Such periods are likely to occur three to seven hours after an insulin injection, when the insulin is given before a meal. In the hospital or doctor's office a capillary blood sugar determination can be done with but little inconvenience to the patient, but routinely the detection of hypoglycemia must be left to the observation of the patient or parent. Older children can be readily educated to recognize the early symptoms and should be taught to do so. In younger children careful observation of the patient for signs of early reactions will usually suffice for their detection. Instructions concerning the treatment of hypoglycemic symptoms should emphasize the necessity of ingesting 5 to 10 grams of glucose with the detection of the earliest symptoms. There is no need for hesitancy in taking this amount of glucose, if given as orange juice or some food* that is not particularly tempting to the child, for it can do no harm and may be urgently needed.

The experience of caring for thirty-six patients over the past year on a diet as prescribed above has shown no need for an increase in the number of insulin injections and no decrease in the control of glycosuria, hypoglycemia and hypercholesterolemia. The good results obtained would seem partly due to the fact that

*For infants under two years of age diets corresponding to those given normal infants of their age and weight are prescribed, the carbohydrate intake being kept at the lower limit of normal.

*All our patients are instructed to keep a can of Karo syrup readily available at home and at school.

such dietary instructions result in a properly balanced diet subject to but minor variations in carbohydrate, protein, fat, and caloric composition. Table 1 presents a record, as estimated from food tables, of maximum variations in the food ingested voluntarily by ward diabetic patients under such a régime. The patients are arranged in the order of their increasing weight. It can be seen that the caloric intake per pound is roughly appropriate for the size of the patients. In the carbohydrate, protein, fat, and total calorie columns the average daily intake with the maximum plus and minus variations are given. Considering that the data were obtained from hospital patients over periods when they were both in bed and up and about the ward the variations in the daily composition of the diet of a given child are slight. Actually the variation that does occur is probably beneficial rather than otherwise. The child eats more when he has been active or hungry from hypoglycemia and eats less when inactive or feeling unwell from a digestive disturbance or infection. On a constant insulin dosage such changes in the diet will tend to keep the patient in balance in spite of changing conditions.

TABLE 1

AVERAGE COMPOSITION AND VARIATION OF DIABETIC DIETS

Patient	Wt. Lbs.	Food, Grams C	P	F	Total Cal.	Cal./ Lb.
J. B.	25	93	44	46	962	38
9 days		±9	±4	±6	±89	
B. F.	36	102	49	50	1054	29
5 days		±4	±3	±1	±13	
R. F.	46	144	66	54*	1326	29
19 days		±17	±15	±12	±150	
M. M.	53	154	70	72	1544	29
8 days		±14	±6	±11	±80	
J. K.	61	159	70	64	1492	25
5 days		±10	±6	±10	±72	
S. C.	70	170	71	65	1549	22
16 days		±25	±8	±10	±209	

*Low fat specified.

The institution of this régime has lessened the hospitalization period of these patients markedly. If a patient enters the hospital without coma, he is immediately placed under such dietary management, the fat being limited until any ketosis disappears. If he enters the hospital in coma, the coma and acidosis are cleared up within the first twenty-four hours and the child is then placed on the régime. Untreated patients entering the hospital may be adjusted to diet and insulin within three to six days and are discharged to the out-patient department or their private physician where final adjustments to home conditions are made during the next week.

The actual adjustment of one child to diet and insulin was as follows:

> An eight year old untreated diabetic girl went into diabetic coma June 11, three days before admission. During those three days she received 200 units of insulin, fluids and carbohydrate and recovered from coma. She entered this hospital at 3 P.M., June 14, having received 30 units of insulin before breakfast. The urine showed a thick green color on testing with Benedict's solution and a one plus acetone by the nitroprusside test. The capillary blood sugar was 100 mgm. per cent. She was placed on the general diabetic diet and was given 20 units of insulin before supper. The following morning the before breakfast urine showed a brown color in the Benedict's test and no acetone. The fasting capillary blood sugar was 230 mgm. per cent. The history and data thus far obtained without any delay in the treatment established the diagnosis of diabetes mellitus beyond any doubt.
>
> She was given 28 units of insulin before breakfast. No mid-morning carbohydrate was given and at 11:30 A.M. the capillary blood sugar was 50. This low blood sugar illustrates the tendency for late morning hypoglycemia when relatively large doses of insulin before breakfast are required to care for the noon meal without insulin immediately before it. The urine showed a trace of sugar before supper and the patient was given 24 units of insulin. At 8:30 P.M. she felt hot and "shaky" and was given 8 ounces of orange juice with immediate relief of the symptoms. The before breakfast urine on June 16 was cloudy green to Benedict's and the fasting capillary blood sugar 190 mgm. per cent. She was given 20 units of insulin before breakfast, 8 before lunch, and 20 before supper and 8 ounces of orange juice were given at 8 P.M. Benedict tests of the urine at 12:30 P.M. following lunch, 8 P.M., 5 A.M. and 7 A.M. were respectively light green, blue, blue, and light green. She was discharged to the Out-Patient Department at 12 noon, June 17, after three days in the hospital taking 20 units of insulin before breakfast, 8 before lunch, and 16 before supper.
>
> During the next ten days three visits were made to the Out-Patient Department and over that period her insulin was reduced to 20 units before breakfast and 12 before supper. The child then went to New Hampshire and by instruction through letters the insulin was reduced gradually until at the end of four weeks she was taking only 12 units before breakfast. In two months the child had gained 10 lbs., had had no insulin reactions, and from the daily record of three urine tests per day had no periods of excessive hyperglycemia.
>
> The discovery of diabetes in this child on June 14 while traveling east on the train for the summer had taken but 5 days from her summer vacation and caused no other limitations of her summer activities.

Both parents and children have been enthusiastic concerning the régime outlined above. The mother is relieved of the burden of preparing and weighing out special diets. At the beginning of caring for her child she is not over-

whelmed by the necessity of acquiring a mass of knowledge, but has time to acquire this gradually. The child's limitations both in his own eyes and in those of his playmates are made to appear a minimum. With a little thought and without attracting attention he can eat meals at school or away from home. Thus without detracting from his well-being a great deal is added to his enjoyment of life.

Such a simplification of dietary management does not indicate that experience in the management of diabetic children on the part of the physician is not required. There are many points concerning the variations in the twenty-four hour, weekly, and monthly blood sugar levels and reactions to infection that experience alone teaches how to manage. Moreover, for the untreated or improperly treated case the determination in a few days of the daily insulin requirement together with the optimum number of injections and the times for giving them is largely dependent upon experience with many cases. Nor does such simplification in dietary régime mean that the patient's metabolism is followed less carefully. The tri- or bi-daily urine tests and twenty-four hour tests must be carried out by the patient or parent and his knowledge of the abnormal metabolism and its treatment must be such as to permit his wisely making minor adjustments in the insulin dosage on the basis of the urine analyses obtained and the symptomatology experienced at given times. Indeed the simple dietary régime permits the attention of the child and parent to be focused to better advantage on the details essential to treatment. The results of clinical experience with this simplified dietary régime do, however, indicate that it is of practical advantage in the care of diabetic children, and may contribute much to their happiness and that of their parents.

SUMMARY

A simple dietary régime for diabetic children is described which provides an appropriate and properly balanced diet subject to limited fluctuations in composition and caloric content. The routine procedure of prescribing such a diet and then giving insulin to establish proper carbohydrate metabolism is justified by the results of clinical experience, reduces the period of hospitalization of new patients, and contributes to the happiness of diabetic children and their parents.

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MEDICAL PROGRESS

PROGRESS IN GASTRO-ENTEROLOGY FOR 1934

BY E. S. EMERY, JR., M.D.*

(Continued from page 733, issue of April 18)

Treatment of Peptic Ulcer

The literature on the treatment of peptic ulcer for the past year may be divided into two groups. It is becoming clearer that the standard forms of medical and surgical treatment give about the same results. This is evident as one obtains the reports from various clinics scattered throughout the world. In addition there has been a tendency to try various injection treatments. Numerous substances have been utilized but the reports show that all give about the same results, namely, relief from discomfort in a large proportion of the cases. Unfortunately this improvement usually persists for less than a year.

Nicolaysen states that the association of gastritis with peptic ulcer is less frequent in Norway than in Central Europe but more frequent in the United States. He considers that gastro-enterostomy is indicated in pyloric stenosis with large retention and dilatation of the stomach, irrespective of age. As a general rule, gastro-enterostomy should be the method after forty-five; in women and in cases of gastric ulcer the age for gastro-enterostomy can apparently be slightly lower without special danger of jejunal ulcer (this is not in accord with the reviewer's experience). In operative treatment indicated because of chronic symptoms, resistance to dietetic treatment and for economic reasons, he prefers resection in all patients under forty, especially in men, in duodenal ulcer and in high acid values and gastritis. With gastro-enterostomy mainly for older persons and resection for the younger, he considers resection a relatively safe operation. In technically difficult cases gastro-enterostomy is advised. He emphasizes the need for individualized treatment in each case of gastro-duodenal ulcer.

Jervell concludes from statistics on the end results of medical treatment that good results can be counted on in from forty to fifty per cent of cases treated. He urges early diagnosis and treatment but he says that even after symptoms of more than twenty years' duration medical treatment may be effective and niches apparently due to callous and penetrating ulcers not infrequently disappear under it. In after treatment, economic conditions play a part. Statistics are presented to show that there is no great danger of perforation in the further course of gastro-duodenal ulcer, except in special cases in which there are painful ulcers on the anterior wall. The danger of hemorrhages is considered an indication for surgical treatment.

Church and Hinton have studied 671 cases of peptic ulcer, of which 114 were postoperative cases. They found that surgery cured thirty-seven per cent, improved twelve per cent, leaving fifty-one per cent that were unimproved.

Ryle and Walton discuss the failure of gastric surgery and give figures very similar to those obtained in American clinics. Ryle points out that "triumphs of surgery are more complete and lasting than those of medicine but by the general nature of the risks taken, the failures of surgery are more complete and more lasting". Walton has had a two per cent mortality following a posterior gastro-enterostomy for gastric ulcer and a 4.4 per cent mortality when the operation consisted of "wedge resection for lower curve ulcers". The incidence of gastro-jejunal ulcers has varied from fourteen to 3.9 per cent depending upon the type of operation and the type of case treated.

Udaondo stresses the necessity of patients continuing the medical régime. (It is consoling to some of us who have been preaching the chronic nature of the disease to find that this conception is now being generally recognized and that our present methods of treatment are sufficient to relieve but do not cure the disease.)

Steinberg discusses various exclusion operations. He undertook an experimental study to determine the relation of the distal part of the stomach to postoperative peptic ulcers. He experimented on forty-four dogs of which thirty-five survived long enough from which deductions could be made. He performed on one group of dogs a Finsterer operation with removal of the antrum of the stomach and stripped the mucous membrane off the pylorus. On dogs of another group he performed the Devine operation, leaving the antrum. When a surgical drainage of the duodenum was done on these animals those with the Devine operation developed ulcers, whereas the ones with the Finsterer operation did not. He believes, therefore, that whether the antrum is left intact is important in the production of hydrochloric acid.

P. F. Shapiro and B. N. Berg have studied the return of gastric acidity after subtotal gas-

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trectomy and double vagotomy on dogs. From this work they conclude that there is no experimental proof or convincing clinical evidence that subtotal gastrectomy is the operation of choice for the treatment of peptic ulcer.

Some of the newer methods of treatment are reported below:

Jones administered from ten to fifteen, sometimes twenty units of insulin subcutaneously, fifteen minutes before eating, to twelve patients having recent peptic ulcers in the sense of Troitzky's theory. The action was not immediate but usually in from four to five days of insulin treatment there was a decrease in the pain, improvement in the subjective condition and an increase in weight which was coincident with a decrease of the vagotonus. In seven of the twelve patients of the first group, pain disappeared in four days and the blood from the contents of the gastro-intestinal tract in seven days, in spite of a distinct increase of the gastric secretion. In four persons the symptoms disappeared in from six to ten days and in one patient the feeling of complete well-being appeared only after two weeks. Four of the patients were observed for nine, eleven, thirteen and fifteen months respectively. No recurrences were observed. In one patient there was a recurrence after five and a half months. The ulcer symptoms disappeared again after ten days of insulin treatment. The last group of patients experienced partial relief under the influence of from fourteen to sixteen days of insulin treatment. The pains, although considerably lessened, continued to appear from time to time especially in the periods of nondigestion.

Van Kleeck, Butman and Schultz treated twenty cases of duodenal ulcer and two of gastric ulcer with intravenous injections of sodium citrate and sodium chloride. Symptomatic relief was produced after two to fifteen injections. The authors do not state, however, how long this relief lasted after the injections were stopped.

Bogendorfer resorted to intramuscular injections of a histidine preparation in patients with gastric and duodenal ulcer. He used a preparation, 1 cc. of which contained 0.04 Gm. of histidine monohydrochloride. The daily administration of 5 cc. caused no undesirable complications. The author employed the treatment in about thirty cases. All other medicinal treatments were discontinued while the histidine preparation was administered. Pain disappeared rapidly and within a short time the patient could be put on an ordinary diet. The author gives brief clinical histories of three cases which indicate that the patients could be discharged from the clinic in two to three weeks.

Glaessner still continues to use injections of pepsin in the treatment of peptic ulcer. He gives thirty injections either subcutaneously or intramuscularly; the first ten are increasing amounts of pepsin, the next ten are equal amounts and the last ten are decreasing amounts. This series of treatments may be repeated after six months, because about this time relapses occur occasionally. The pepsin therapy is combined with a dietary, and medicinal therapy. The diet is primarily lacto-vegetarian but some meats and fish are permissible. The author has employed the pepsin therapy in approximately 1,000 cases. The results were favorable in gastric and duodenal ulcers; esophageal ulcers were likewise improved but in jejunal ulcers the results were not so favorable.

Cunha reports his results with a compound known as synodal which is said to be a mixture of lipoproteins and emetin. He has observed twenty-nine cases in over a year and twenty-two have been treated within twelve months. All but two have had prompt relief from pain and so far it has not been necessary to give a second series of injections.

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DUODENUM

Anatomy

R. Grégoire gives a very complete description of the duodenum which is well worth reading by anyone interested in this work.

Weinbren discusses eleven cases of right-sided inversion of the duodenum. Four of the patients were women, ranging in age from forty to seventy. All of these were asthenic and three of them gave a history of recurrent attacks of diarrhea. One had gall stones. The others were men, ranging in age from twenty-six to fifty-four. Their habitus varied more than that of the women, one of them being six feet, two inches. The others, however, were of the hyposthenic type. Two of them complained of attacks of diarrhea. All the patients gave histories of dyspepsia which had persisted for con-

siderable periods, and in two cases the history was suggestive of duodenal ulcer. In the one patient operated upon there was no sign of any ulcer, nor was there any sign of any ulcer roentgenographically. The existence of the duodenal abnormality was confirmed at the operation. Two of the patients had had the appendix removed. The author feels that the condition will be missed roentgenographically unless the duodenum is traced to the duodeno-jejunal junction. The appearances once seen on the screen cannot be mistaken. The inverted duodenum may return to normal when the patient is put into the supine or prone position. A complete examination of the full length of the duodenum during the course of a barium meal would doubtless reveal many more of these cases. In the case of an inverted duodenum the stomach is generally farther to the left of the spine than usual and the cap occupies a more transverse position. At the inferior flexure the third part, instead of extending to the left of the second part turns up to the right of the second part and goes on to join or form the duodeno-jejunal junction which likewise may be situated abnormally.

Grégoire, R.: Anatomy of the duodenum considered from the medical and surgical point of view. Ann. d'anat. et path. 11:209 (Mar.) 1934.
Weinbren, M., and McGregor, A. L.: Right-sided duodenum inversion: Record of eleven cases. Lancet. 1:280 (Feb.) 1934.

Duodenal Fistulae

Sickels and Hudson point out that a biliary fistula communicating with the duodenum may be demonstrated by roentgen examination. They report two more cases in whom the bile ducts filled with barium as a result of such fistulae.

Bunch and Mayer were able to treat successfully a duodenal fistula which developed after operation by means of tube feedings. A blacksmith of fifty-two had been explored for a tender mass in the right upper quadrant. This was found to be due to a large solitary abscess of the right lobe of the liver. The day after operation a duodenal fistula developed. By passing a Rehfuss tube well beyond the region of the fistula and feeding the patient by this means, the fistula healed very satisfactorily.

Sickels, T. N., and Hudson, C. L.: Demonstration of a spontaneous internal biliary fistula by roentgen examination. Am. J. Roentgenol. 31:31 (Jan.) 1934.
Bunch, G. H., and Mayer, O. B.: Abscess of the liver complicated by duodenal fistula. Southern M. J. 27:393 (May) 1934.

Tumors of the Duodenum

Because carcinoma of the duodenum is considered a rare disease cases of this kind are usually published. As nothing essentially new has been given in these cases they have not been abstracted. Williamson, however, cites a case of primary sarcoma of the duodenum in which the tumor started as a fibroma of the duodenum and underwent malignant degeneration. The diagnosis of a duodenal tumor was made during the course of an exploratory laparotomy. A preliminary posterior gastro-enterostomy was performed six months later in anticipation of extirpating the tumor. A partial duodenectomy was successfully performed about eleven months after the diagnosis and the patient had an uneventful recovery.

Williamson, C. S.: Sarcoma of the duodenum treated by partial duodenectomy. Western J. Surg. 42:207 (April) 1934.

Periduodenitis

Writers have previously advanced the idea of some relationship between the appendicular-cecal area and the pylorus. Kadrnka and Bardet believe that periduodenitis of appendicular origin is more frequent than is usually supposed. They state that it is more frequent than post-calculous or post-ulcerous periduodenitis and is usually found in young adults. So-called ulcerous periduodenitis must be considered only after the exclusion of disorders both near and far and especially appendicitis, even when apparently clinically cured. In such instances histologic evidence of the remains of an old appendicitis is necessary. Periduodenitis of appendicular origin generally involves the proximal part of the first portion of the duodenum and the lesser curvature of the bulb. It is also frequently localized at the level of the third part in the region of the neck of the mesentery, thus producing a mesocolic form which is characterized by nonreducible stenosis. In practice, appendicular periduodenitis forms two groups: that in which the dyspepsia is accompanied by the appendicular syndrome and that in which it is not. In the first form roentgenography is largely responsible for the pathological diagnosis. In the second group clinical diagnosis is especially difficult. The authors feel that treatment should be directed both toward operative freeing of the duodenal adhesions and removal of the primary focus, i.e., the appendix. Although good results sometimes follow appendectomy alone, a second operation is often necessary and it seems desirable to perform the two procedures at the same time rather than run the risk of a second operation. They conclude that in view of the numerous early and late complications of appendicitis it is wise to remove this organ at the first sign of involvement and it is better to remove a normal appendix than chance the complications of which periduodenitis is only one.

B. R. Kirklin gives the roentgenographic signs of duodenitis as, (1) increasing irritability resulting in an intense spasticity and hypermotility; the bulbar shadow appears less dense than in a frank ulcer; (2) the mucosal pattern

is coarsely and irregularly reticular; (3) the absence of an ulcer crater and (4) the absence of gastric retention.

Kadrnka, S., and Bardet, P.: Périduodénites d'origina appendiculaire. Arch. des Maladies de l'Appareil Digestif. 24:354 (April) 1934.
Kirklin, B. R.: Duodenitis and its roentgenographical characteristics. Am. Jour. Roentgenol. 31:581 (May) 1934.

Duodenal Diverticula

There have been numerous articles about diverticula of the various parts of the gastro-intestinal tract most of which do not contribute anything to our knowledge. However, Schmidt and Guttman point out a fact that is worth remembering, namely, that jejunal diverticula may suggest gastric disease if the jejunum should overlie the stomach.

On the basis of seventeen case histories, Frentzel-Beyme explains the connections between duodenal diverticula and pancreatitis. The characteristic pain on the left side or in the back, the pancreatic stool and the increased or greatly fluctuating diastase values are the most significant of the symptoms indicating pancreatic involvement. Increased blood sugar content and the enlargement of the space of the head of the pancreas may indicate a pancreatic involvement, but they are frequently absent. A negative roentgenologic examination does not definitely exclude impairment of the pancreas. The author thinks that in extensive destruction of the pancreas there is usually a gastric subacidity which requires further investigation on a larger amount of material. In case of duodenal diverticulum there exist nearly always atypical intestinal disorders (heartburn, nausea, vomiting and a sensation of pressure in the gastric region). If the pancreas is involved from the beginning which is the case when the duodenal diverticulum is located at the duodenal papilla, typical pancreatic symptoms are generally disclosed by the history. In these cases the course is usually rather severe and there is danger of acute necrosis of the pancreas. The duodenal diverticulum causes disturbances only when it retains substances and subsequently becomes inflamed. This is the case when the pedicle connecting the duodenal canal with the diverticulum is rather narrow. If the pancreas is in the normal position it becomes involved in the disturbances only if the diverticulum is on the concave side of the duodenum.

Schmidt, E. A., and Guttman, P. H.: Multiple diverticula of the jejunum and duodenum simulating gastric diverticula and complicated by cholelithiasis. Am. J. Roentgenol. 31:200 (Feb.) 1934.
Frentzel-Beyme: Duodenal diverticulum and pancreatitis. Med. Klin. 30:1296 (Sept.) 1934.

LIVER

For a pretty complete and carefully compiled description of the relation of the liver to the metabolism of carbohydrates and fats, one should read the three lectures delivered by C. H. Best for the University of London at the University College. He discusses in order the methods of approach to the problem of the liver in relation to carbohydrate metabolism and deposition of liver fat. The lectures are too comprehensive to abstract satisfactorily.

Best, C. H.: The rôle of the liver in metabolism of carbohydrate and fat. Lancet. 1:1155 (June) 1934.

Functional Tests of the Liver

In recent years there has been much work devoted to an attempt to find tests which will be of clinical value in determining the condition of the liver. In view of the large number of functions which the liver performs it is difficult to understand how any single test can be of much value.

This has been emphasized by the work of F. C. Mann. He has removed varying amounts of the liver up to total extirpation and found that very slight impairment of the physiologic functions resulted, even if only a minimal amount of the liver was left, which was sufficient to maintain life. Therefore, with such a large factor of safety, the liver may be badly diseased before any functional test will give evidence of impairment. No attempt has been made to abstract the numerous articles on liver function tests inasmuch as they have contributed little of value during the past year.

Mann, F. C.: Hepatic function in relation to hepatic pathology: Experimental observations. Ann. Int. Med. 8:432 (Oct.) 1934.

The Bile

In the course of roentgenologic studies on the small intestine, Bayer noted that in cholecystopathies the roentgenograms of the small intestine show certain characteristic changes in motility and in the shape of the intestinal loops. Passage of the intestinal contents is retarded and the intestinal loops are dilated which indicates that the hepatobiliary diseases influence the peristalsis and the tonus of the small intestine. In an attempt to explain this behavior of the small intestine during hepatobiliary disorders, he points out that the bile has an inhibiting influence on the smooth muscles and that, if bile enters the blood, the tonus and the peristalsis are reduced.

Sackey, Johnston and Ravdin have studied the fate of bilirubin in the small intestine. Since there was no loss of bilirubin from the jejunal loop and no loss of bilirubin when pigment was incubated with the juice from the loop segment or juice from the entire small intestine, they conclude that the intestinal juice alone has no effect in converting bilirubin to urobilin during a period of two hours and that in the jejunal loop there was no absorption of pigment and no conversion to urobilin. The experiments on dogs showing loss of pigment in the entire intestinal tract suggest that in some

place other than the jejunal portion of the intestine, the combined activity of intestinal contents and intestinal cells does not affect the bilirubin in the intestine. Whether the loss of bile pigment under such circumstances is due entirely to conversion, to conversion and absorption or to absorption of bilirubin as such remains to be seen.

Jones and Laing have found that if dogs were fed with large quantities of viosterol, there was no increase in the calcium content of the bile and therefore there is no reason to feel that large amounts of Vitamin D may contribute to the formation of gall stones.

Dragstedt and Woodbury have shown that bile is not essential for the secretion of pancreatic juice. Food in the absence of bile promotes the usual flow of pancreatic juice. Bile salts cannot be considered essential either for the activation of the specific pancreatic stimulant or for its passage into the blood in effective form. (These results obtained from working on dogs are in contradiction to the findings of Mellenby when he studied the effect of bile on pancreatic secretion in cats.)

Bayer, L.: Atony of small intestine, a symptom valuable in the diagnosis of disease of the hepato-biliary system. Deutsche med. Wchnschr. 60:1270 (Oct.) 1934.
Sackey, M. S.; Johnston, C. J., and Ravdin, I. S.: Fate of bilirubin in small intestine. J. Exper. Med. 60:189 (Aug.) 1934.
Jones, K. K., and Laing, G. H.: The effect of viosterol on the calcium content of the dog's bile. Am. J. Physiol. 110:471 (Dec.) 1934.
Dragstedt, L. R., and Woodbury, R. A.: The relation of bile to the secretion of pancreatic juice. Am. J. Physiol. 107:584, 1934.

GALL BLADDER

Ivy and Bergh have written in the *Journal of the American Medical Association* on the applied physiology of the extrahepatic biliary tract, which is an excellent summary of our knowledge of what is known about the physiology of the gall bladder.

Ravdin and others show that extensive changes occur in the concentration of bile in various surgical lesions of the biliary tract. They have found that the changes which normally take place in the bile as it enters the gall bladder are very considerable. They believe that the gall bladder plays an important rôle in physiological economy and should not be removed without definite evidence that its function is impaired. When the gall bladder becomes damaged, either by infection or by obstruction of the extrahepatic duct, profound changes occur in the chemical composition of the hepatic bile.

Heckmann discusses the part played by the enterohepatic circulation in digestion and in detoxication and the function of the gall bladder in the enterohepatic circulation. He concludes that with the exception of cholesterol and lecithin all biliary substances take part in the enterohepatic circulation. This signifies that the cells of the liver have to replace only those quantities of bile that are lost (elimination with feces, etc.) whereas the largest portion of the biliary constituents are carried to the liver with the portal blood and merely have to be excreted in the bile passages. In case of destruction of this circulation, there is a considerable reduction in the biliary excretion. Such a change in the enterohepatic circulation takes place in diseases of the liver, such as cirrhosis, in which, as a result of the overflow of the enterohepatic circulation, large amounts of substances contained therein enter into the greater circulation. The gall bladder has the capacity to store and concentrate all the circulating bile. It acts as a regulator of the constantly circulating bile from the liver to the intestines and back to the liver again, and its function is to adapt the circulating bile to the requirements of the digestion. The author points out that the exclusion of the protective organ favors the development of hepatic disorders.

Graham and Mackey have studied the result of cholecystectomy in the absence of gall stones. In the absence of severe pain the beneficial results to be obtained by cholecystectomy in cases of a stoneless gall bladder are likely to be unsatisfactory in approximately forty per cent. They believe at present there is little justification for the subjection to operation of patients who have only the beginnings of cholecystic disease, unless one is interested in the prevention of complications. In order to arrive at a satisfactory incrimination of the gall bladder, it is necessary to examine the patient thoroughly with reference to the possibility of other sources of the complaints. Even after the presence of cholecystic disease is demonstrated in the anatomic sense, it is still difficult to satisfy oneself that the function of the organ is sufficiently disturbed by those pathologic changes to cause the symptoms of which the patient complains.

Melchior states that the findings at the time of operation of bile in the peritoneal cavity without a visible perforation of the gall bladder or the bile tracts, suggest three possibilities: (1) actual absence of perforation, (2) a perforation that has taken place but has become sealed and could not be detected as such, and (3) an existing perforation not noticed because of the difficulty of exposure, its true character being revealed, as a rule, at necropsy. A distinction, therefore, must be made between the clinical concept of bile peritonitis without visible perforation and its narrower anatomico-pathologic concept. To the latter group belong the cases that are the result of a simultaneous effect of an infection and stasis on the walls of the gall bladder and the biliary tracts. Under such conditions the bile may diffuse through the gall bladder wall without the existence of an actual perforation. There is clinical and experimental

proof that regurgitation of the pancreatic secretion into the bile tract may likewise bring about an abnormal transfusion of bile. Under certain pathologic conditions such as obstruction of the cystic or the common duct and acute inflammation of the wall of the gall bladder, the latter was seen by the author to "sweat" bile. The author reports two cases in both of which there was found at operation a severe bile peritonitis without visible perforation. Both were instances of chronic choledocholithiasis with actual supervening partial necrosis of the liver.

Saralegui advocates the injection of 20 to 30 cc. of thorotrast of Heyden in the drainage tube after cholecystectomy. By use of the fluoroscopic screen, he believes that the presence or absence of hepatic stone may be satisfactorily observed.

Vastine reports two cases of diverticulum of the gall bladder, one of which contained a stone. He suggests that if the diverticulum overlies the kidney this may be misinterpreted as a renal calculus.

Ivy, A. C., and Bergh, G. S.: The applied physiology of the extrahepatic biliary tract. J. A. M. A. 103:1500 (Nov.) 1934.

Ravdin, I. S.; Riegel, C.; Johnston, C. G., and Morrison, P. J.: Studies in biliary tract disease. J. A. M. A. 103:1504 (Nov.) 1934.

Heckmann, K.: Function of the gall bladder as regulator of entero-hepatic circulation and as detoxicating organ. Klin. Wchnschr. 13:760 (May) 1934.

Graham, E. A., and Mackey, W. A.: A consideration of the stoneless gall bladder. J. A. M. A. 103:1497 (Nov.) 1934.

Melchior, E.: Bile peritonitis without visible perforation. Deutsche Ztschr. f. Chir. 243:458 (June) 1934.

Saralegui, J. A.: Cholangiography. Am. J. Roentgenol. 32:167 (Aug.) 1934.

Vastine, J. H.: Diverticulum of the gallbladder. Am. J. Roentgenol. 31:603 (May) 1934.

THE PANCREAS

Grandclaude and his associates review the history of pancreatic cysts and report a case which they studied. This is quite a complete article in which they discuss the etiology, frequency and relation of the condition to age, sex, the predisposing factors, classification, gross and microscopic anatomy and finally they suggest a classification based on morphology.

Mikkelsen discusses severe acute pancreatitis. A review of the literature shows that its treatment remains almost exclusively operative and that the results of such treatment still show an average mortality of fifty per cent. The author points out that there is no anatomic basis for an operative attack on the pancreas. The pancreas has no true capsule in the anatomic sense of the term. The structure that is divided on incision into the pancreas is the peritoneum covering the organ, and an incision through this peritoneal covering cannot relieve the secretory tension. The pancreas is made up of many small lobules that are separated by thin septa of connective tissue each inclosing an individual lobule. In order to relieve the pressure tension in the pancreas it would be necessary to divide the thin layer of connective tissue covering each lobule and that would not be feasible. Besides, these interlobular connective tissue septa are intimately connected with the glandular tissue, which is always affected at the same time. An operation of this kind is thus apt to cause an increase rather than a reduction in the necrosis and intoxication. The theoretical basis for an operation on the bile ducts is more logical but the systematic employment of such operative measures in recent years has not lowered the case mortality decidedly. Recently a few surgeons have turned to a more conservative treatment, some of them postponing the operation until the "shock stage" is passed, others waiting until all acute symptoms have subsided, after which an operation is performed for gall stones when such are found to constitute the underlying cause of the acute pancreatitis. Operation is performed also if the process goes on to abscess or cyst formation. During the last eight years they have treated conservatively thirty-nine patients with severe acute disorders of the pancreas. Twenty cases were extremely ill, their general condition being very poor. Three of the twenty patients died and the remaining nineteen were gravely ill but not actually shocked. Operation was performed only in cases in which gall stones were ascertained and not until from one to three weeks after the acute symptoms had subsided. The treatment adopted by the author consists of a supply of fluid by mouth, skin and vein and the use of stimulants and peristaltics. The mortality with this conservative treatment was 7.5 per cent.

Zelikson has found in a study of thirty-five cases that determination of ferments obtained with the aid of the Einhorn duodenal tube is entirely unreliable. The determination of amylase in the urine in thirty-three cases likewise proved to be of little diagnostic value. The author examined the lipase and amylase blood content in ninety-two cases. Determination of the blood lipase after the method of Rhon depends upon the fact that in patients with pancreatic disease the atoxyl fails to activate the lipase, while in the normal organism its effect is to activate the ferment. The reliability of the Rhon test for lipase and of the Wohlgemuth test for the amylase was verified in thirty-three cases either at operation or at necropsy. In a group of eight cases of proved pancreatic lesions, there were four instances of a negative Rhon test. The author concludes that the reaction of Rhon is of value in functional diagnosis of pancreatic disease, particularly in the early stages. The reaction may be negative even in extensive involvement of the organ shortly before death.

Hyperinsulinism

Hyperinsulinism is being recognized more and more frequently. Most of the articles that have been recently published emphasize the frequency and the various symptoms that may be produced by this condition, but have not added anything essentially new to the early reports.

Harris has written an article for the *American Journal of Digestive Diseases* which covers most of the work in this field and the reader is referred to the article for further information.

Grandclaude, C.; Dellanoy, E., and Driessens, J.: Cysts of the pancreas. Ann. d'anat. path. 11:433 (May) 1934.
Mikkelsen, O.: Acute pancreatitis. Acta chir. Scandinav. 75:373 (Sept.) 1934.
Zelikson, A. A.: Functional diagnosis of diseases of the pancreas by determination of lipase and amylase content of the blood. Sovet. vrach. gaz. No. 12:908 (June) 1934.
Harris, Seale: Clinical types of hyperinsulinism. Am. J. Digest. Dis. & Nutrition. 1:562, 1934.

JEJUNUM

Quigley, Highstone and Ivy have made a Thiry-Vella loop of intestine in the jejunum and studied its propulsive activity by observing the rate at which a bolus was propelled through the loop. They found that the rate was practically constant at 1.5 cm. per minute. Disuse of the intestine led to marked prolongation of the propulsive time but this was readily overcome by the intestinal or intravenous injection of hypertonic saline solution.

Longacre reports two cases of so-called duodenojejunal hernias of Treitz. He had an opportunity to work out carefully the anatomical details. As a result of this study he concludes that the condition is due to a congenital abnormality as recently suggested by Andrews, Eisler, Fischer and Bender. This is opposed to the theory of Treitz that the condition is due to a widening and deepening of one of the many pre-formed fossae about the duodenojejunal flexure as a result of the pressure and peristaltic movement of the small intestine.

Quigley, J. P.; Highstone W. H., and Ivy, A. C.: A study of the propulsive activity of a Thiry-Vella loop of intestine. Am. J. Physiol. 108:151 (Apr.) 1934.
Longacre, J. J.: Mesentericoparietal hernia. Surg. Gyn. & Obst. 59:165 (Aug.) 1934.

Parasitology of Jejunum

Ronka presents an interesting case of infection with Dibothryocephalus latum in which, though the patient harbored the fish tapeworm in her intestine, she suffered no ill effects from the parasite. She presented a variety of clinical manifestations without anemia. The functional disorders were referable to the alimentary tract.

Gibbes writes on the symptoms produced by hookworm infections which are suggestive of duodenal ulcer. The patients have hunger pains but they do not have the pains with the unfailing, clock-like regularity of true ulcer. The pain seems to be located quite frequently in the upper part of the abdomen. In the patient having intestinal parasites the symptoms continue without periods of relief usually experienced by ulcer patients. An eosinophilia should always suggest the possibility of an intestinal parasite and is often the lead that elicits a correct diagnosis. The number of eosinophiles vary in these diseases from two per cent to as high as seventeen per cent in the author's series, though much higher counts have been reported. The roentgen observations of the stomach and duodenum are to some extent similar in both duodenal ulcer and in parasitic disease of the intestinal tract. The stomach is irritable and tends to empty with abnormal rapidity in both conditions. The pylorus is spastic and the duodenal cap is abnormal. However, in duodenal ulcer the duodenal deformity persists in spite of every effort to overcome it, while the duodenal deformity resulting from parasitic disease can be made to disappear under fluoroscopic manipulation. The back and forth, churning movement in the duodenum associated with hookworm disease and described by Henderson, is an important diagnostic criterion. (Although hookworms are rarely seen in this part of the country, the fact that parasites can simulate the symptoms of various diseases of the intestinal tract should be kept in mind. The reviewer has seen one case which suffered from symptoms suggestive of duodenal ulcer and was promptly relieved after the passage of an ascaris.)

Kendrick has studied the length of life and the rate of loss from the body of hookworms. He infected twenty volunteers with Ankylostoma injections and five volunteers with Necator injections. The average period between application of larvae to the skin and the appearance of ova in the stools averaged fifty-three days. The patients' feces were studied for ova and it was found that the number of ova increased for twelve to eighteen months. This was followed by a decline of fifty per cent to seventy per cent of egg production in a period of from three to six months. The maximum period from the date of injection to the disappearance of ova in the feces of one Ankylostoma patient was eighty-one months. The average for three patients was seventy-six months and in the only Necator case under observation throughout the course of infection the egg count was positive for only twelve months, but ova were detected by direct centrifugal flotation method sixty-four months after the date of injection.

Ronka, E. K. F: Infestation with Diphyllobothrium latum. Fish tapeworm. N. Eng. J. Med. 210:582 (Mar.) 1934.
Gibbes, G. H.: Symptoms suggestive of duodenal ulcer arising from hookworm infection. J. South Carolina M. A. 30:102 (May) 1934.
Kendrick, J. F.: The length of life and the rate of loss of the hookworms, Ancylostoma duodenale and Necator americanus. Am. J. Trop. Med. 14:363 (Sept.) 1934.

ILEUM

There have been several reports of fibrotic changes occurring in the ileum and occasionally

involving the ileocecal region. Kantor reports the data obtained from six cases. Pain and dilatation were present in all six patients. Fever occurred at some time in five. All were operated upon and except for one who died from a perforation found at the time of operation, the others were well from one to five years after resection of the involved area. He summarizes the chief roentgenoscopic changes in the ileum as follows: (a) filling defect just proximal to the cecum, (b) abnormality in contour of the last filled loop of ileum, (c) dilatation of ileac loops just proximal to the lesion and (d) a narrow string of barium at the site of the actual lesion.

H. G. Bell reports a case of chronic cicatrizing enteritis. This was in a woman twenty-eight years old whose complaints were weakness, breathlessness on exertion, palpitation, pallor and epigastric pain. Physical examination showed a mass in the left lower quadrant and a rather marked secondary anemia. Operation revealed a lesion in the ileum about sixteen inches from the ileocecal valve, causing a partial obstruction with a resulting dilated and hypertrophied bowel above it. The mesentery was edematous and the lymph nodes were enlarged and hyperplastic. Pathologic examination revealed a subacute and chronic inflammatory reaction.

Donchess and Warren, using the same terminology of chronic cicatrizing enteritis, report the case of a woman sixty-two years old who suffered from attacks of abdominal cramps, constipation, and flatus. The x-ray diagnosis of carcinoma of the hepatic flexure was made. After removal the specimen showed cicatrization of the terminal ileum. The cecum and ascending colon showed evidence of a long-standing fibrotic process. The mucosa was ulcerated. The authors were unable to suggest any etiological factors.

Jackman, in the *British Journal of Surgery*, speaks of a hypertrophic enteritis occurring in two females, one thirty-seven years old and the other fifty-five years old. Both were operated upon for supposed acute appendicitis; both showed a markedly congested and hypertrophic terminal ileum. The author shows microphotographs of the histological condition and gives some excellent pictures of the gross appearance.

(Crohn was the first to direct the attention of the profession to this condition and gave it the term "regional ileitis". However, since the cause of the condition is not known and the reports coming out since that time suggest that the pathologic process may occur in almost any portion of the intestinal tract, the term chronic cicatrizing enteritis would seem to be a better one. As yet no one has been able to explain the cause of this condition. In most instances cures have been reported after resection of the infected part, yet this does not always occur, as illustrated by a case seen by the reviewer, who has had three radical resections without cure.)

Kantor, J. L.: Regional (terminal) ileitis, its roentgen diagnosis. J. A. M. A. 103:2016 (Dec.) 1934.
Bell, H. G.: Chronic cicatrizing enteritis. California and West. Med. 41:239 (Oct.) 1934.
Donchess, J. C., and Warren, S.: Chronic cicatrizing enteritis. Arch. Path. 18:22 (July) 1934.
Jackman, W. A.: Localized hypertrophic enteritis as a cause of intestinal obstruction. Brit. J. Surg. 22:27 (July) 1934.

OMENTUM

Ransom and Samson report an angiosarcoma of the greater omentum which resulted in a massive intra-abdominal hemorrhage. From a study of the literature they were able to find seventy-five cases of verified primary malignancy. They give a table listing the chief points for all these seventy-five cases, including the type of cell tumor. Most of the results have been poor due to the great tendency to recurrence.

Ransom, H. K., and Samson, P. C.: Malignant tumors of the greater omentum. Ann. Surg. 100:523 (Sept.) 1934.

THE DIARRHEAS

The Morro treatment of diarrhea by the apple diet continues to be used in European Clinics. Baumann and Forschner-Böke state that although the favorable influence of the apple and banana diet on diarrheal disturbances has been definitely established, the mode of action is still in dispute. Investigations on the latter problem convinced them that the pectins, particularly because of their great swelling capacity, are the most important therapeutic factor. They observed that the swollen, voluminous intestinal contents present in the case of the apple and banana diet stimulate the peristalsis and accelerate the passage and thus counteract the stagnation of the ingesta, which results from the diarrhea. By the administration of pure pectins, it could be shown that they increase the peristalsis and also have an absorptive action. The fact that the diet provides almost exclusively carbohydrates and that it is practically free from fats and proteins should likewise not be overlooked. The acidification of the gastric contents by the malic acid may be of some influence in that it increases the bactericidal effects, but that this factor is only of minor influence was proved by experiments with neutralized apple and banana diets. The tannin contained in apples and bananas is likewise of only minor part in the therapeutic action of apple and banana diets as proved by buffer curves. The authors further report studies on the stools in the apple and banana diet. They determine the pH, the buffering value, the water, fat and mineral contents and the organic acids and they discuss the results of these tests. They conclude that in older nurslings and in young children the banana diet gives better results than the apple diet.

Schachter has written a rather complete article on the fruit diet in diarrhea in children. He states that he has recently used raw pears and apricots in a case of dysenteriform diarrhea in a girl thirteen months of age with equally good results. He believes that the mechanism of the action of all these fruits is probably the same and that it is due to the organic acids of the fruits.

Roberts reports a case of what he called celiac disease in adults by putting the patient on a sugar-less milk, banana and meat diet. The ordinary forms of carbohydrate were absent. Although such carbohydrates themselves are absorbed and were at no time found undigested in the feces, they appear to arouse the symptoms of celiac disease, including interference with calcium metabolism and resulting tetany and impairment of the utilization of other food-stuffs. The banana is helpful in celiac disease. Its carbohydrate can be used, it seems indefinitely, without giving rise to the symptoms of the complaint, which is not the case with other carbohydrates. With the banana the proportion of carbohydrate, protein and fat can be balanced satisfactorily and utilized. The diet when established has a high fat content, most of which is absorbed. In a research on another patient passing large fatty stools, it was found that milk fat was more easily absorbed than other forms of fat. When this patient recovered fifteen years ago on a meat diet it was then possible to use ordinary foods beginning with bread and butter in moderation. The same is found in other cases of this disease on the regimen described by the author. It is important, however, not to try such an addition until after at least six months of health on the special diet.

Thaysen reports on some cases of idiopathic steatorrhea which he has seen. In the first case the symptoms of the disorder set in nine years earlier. In the second, the disturbance dated back to childhood. The first patient was a man, aged thirty-two, and the second a woman, aged twenty-four. Both patients had been treated at home and hospitalized at various times. Abdominal tuberculosis had been suspected. The cases were treated under the diagnoses of Addison's Disease, periglandular insufficiency and anemia. The author states that while there was marked pigmentation of the skin, neither of the patients had typical Addison's Disease. Symptoms of endocrinopathy and avitaminosis appeared together. In the first case there were pronounced tetany and pigmentation; in the second dwarfism of the hypophyseal type, glossitis, pigmentation, hemorrhages in the skin and osteoporosis and latent tetany. The anemia in idiopathic steatorrhea may be so marked as to dominate the entire picture and the two attacks of grave anemia which occurred in both cases, diverted attention from the steatorrhea. The diagnosis of idiopathic steatorrhea is not confirmed by the demonstration of an excess of fat in the stools. The presence of this abnormality without jaundice or signs of occlusion of the choledochus calls for examination of the blood sugar curve after the administration of dextrose. If the blood sugar curve is low the diagnosis of idiopathic steatorrhea must be made, since neither pancreatogenous steatorrhea nor steatorrhea in intestinal amyloidosis nor intestinal tuberculosis is accompanied by low blood sugar.

Baumann, T., and Forschner-Böke, H.: Investigations on therapeutic action of apple and banana diet. Ztschr. f. Kinderh. 56:514 (Sept.) 1934.
Schachter, M.: Fruit diet in diarrhea in children. Arch. de med. d. enf. 37:139 (Mar.) 1934.
Roberts, C. G.: Coeliac disease in an adult treated with sugar-less milk, bananas and meat. Lancet. 1:130 (Jan.) 1934.
Thaysen, T. E. H.: Two cases of idiopathic steatorrhea with special consideration of diagnosis and occurrence of symptoms of endocrinopathy and avitaminosis. Hospitalstid. 77:1033, 1934.

The Dysenteries, Other Than Amebic

Kellogg discusses the classification of acute dysentery other than the amebic, mentioning the various organisms that have been held responsible for different outbreaks. He points out that "the entire group is closely related and of complex antigenic structure, resulting in cross agglutination reactions to a confusing extent". He believes that interest in amebic dysentery is resulting in undue emphasis on this form of diarrhea in laboratories and that some reports of amebic dysentery emanate from laboratories whose technicians are not properly grounded in the protozoölogy of the intestinal tract.

Mackie made a cultural and serological study of eighty-three cases of ulcerative colitis for evidence of bacillary infection. Forty-two per cent showed definite evidence of bacillary dysentery and the dysentery bacillus was actually recovered in 20.4 per cent. Similar evidence of infection was found in only nine of 102 control cases. The authors therefore believe there is evidence that bacillary dysentery may be the etiological agent in certain cases of so-called idiopathic ulcerative colitis.

Alexander and Wu give incidents of neurogenic symptoms arising from the brain and spinal cord in patients with amebic and bacillary dysenteries. Some are apparently due to avitaminosis, some may be due to cord changes similar to what occurs in primary anemia without evidence of anemia and in some there is no explanation for the symptoms.

Lauda writes on the treatment of enteritis caused by lamblia in the stool of a patient with an enterocolitis which had been refractory to diet, and medicinal treatment. Lamblia was recovered. By means of a duodenal tube he introduced into the duodenum of the patient a so-

lution of 0.3 Gm. neoarsphenamine in 200 cc. of water. The diarrhea ceased at once and two days later the stools were of normal color and consistency. On the third day the stools were entirely free from the organisms but in spite of after treatment with acetarsone they reappeared later. However, there was no relapse of the clinical symptoms. To destroy the organisms the administration of neoarsphenamine by means of the duodenal tube was repeated several times and was followed by renewed treatment with acetarsone. As a result of these measures they disappeared completely within ten days and the author states that ten weeks after the treatment the patient was free from symptoms, the stools were normal and repeated search for lamblia gave negative results. He points out that the literature gives other cases in which arsenic preparations produced such favorable results but that there are also cases in which this therapy failed completely. However, he thinks that it should always be tried. To avoid relapses the patients should be warned that dietary mistakes and colds are likely to cause recurrences.

Kellogg, W. H.: Bacillary dysentery. California & West. Med. 41:296 (Nov.) 1934.
Mackie, T. T.: Ulcerative colitis: The relationship between bacillary dysentery and ulcerative colitis. Southern M. J. 27:492 (June) 1934.
Alexander, L., and Wu, T. T.: Symptomatic involvement of the nervous system in different forms of dysentery. Chinese M. J. 48:1 (Jan.) 1934.
Lauda, E.: Therapy of enteritis caused by lamblia. Wien. klin. Wchnschr. 47:1132 (Feb.) 1934.

Amebic Dysentery

As previously stated the Chicago epidemic of amebic dysentery has aroused much interest in the disease and many articles have been written on the subject. Only a few of these have been abstracted. Meleney has reported on the pathology of amebiasis and states that the lesions are the result of its mechanical invasion and toxic action on the tissues of the host. The distribution of amebic lesions in the colon may be either general or localized. Localized lesions are found most frequently in places where stasis normally occurs. In their order of frequency these places are the cecum, the ascending colon, rectum, the sigmoid, the appendix and the splenic and hepatic flexures. In general the most severe lesions tend to occur in the cecum but may be found as low as the sigmoid. In addition to the colon the terminal portion of the ileum is occasionally found to be involved. It is probable that such involvement is aways secondary to lesions in the colon. Liver abscess secondary to intestinal lesions is a common complication. Extension of the liver abscess through the diaphragm into the lung is common with development of a secondary lung abscess surrounded by pneumonia. Extension into the pleural and pericardial cavities also occurs. Amebic abscess of the brain has been reported, usually secondary to liver and lung abscesses.

Magath states that the laboratory diagnosis of amebiasis requires special knowledge and skill and should not be attempted except by those adequately trained. The direct smear method is adequate in the hands of those properly trained but, if doubt exists, one should resort to fixed and stained preparations. Culture methods should be used in laboratories qualified to identify amebae but for the usual routine cultures are not necessary, provided the examiner knows how to make proper direct examinations. Until the complement fixation method is simplified it is not suitable for routine tests.

Reed and Johnston as the result of a study on one thousand inmates at San Quentin Penitentiary, have reported good results with carbarsone in the treatment of amebic dysentery. They also report a satisfactory method of diagnosis by the following means: thin smears were made from fresh stool specimens; without drying, the slide was immersed in Schaudinn's fixing fluid where it remained until the next morning; it was then placed for ten minutes in seventy per cent alcohol tinged to a wine color with compound iodine solution; after this the slide was placed in bottles of seventy per cent alcohol and sent by post to their laboratory where the iron hematoxylin staining method as described by James was completed.

Anderson and Reed discuss the untoward effects of anti-amebic drugs. They point out that emetin hydrochloride is toxic for most mammals including man, in total doses of ten to twenty-five mgm. per kilogram of weight. The heart muscle bears the burden of the toxic effect. The maximal safe total dose of emetine hydrochloride is ten mgm. per kilogram of weight in patients with an amebic hepatitis and free from heart damage. Acetarsone may exhibit toxic manifestations in one of every six cases treated. The case of a patient showing intolerance to five Gm. of this agent taken over a period of twenty-eight days is reported. Acetarsone, in the authors' opinion, is too toxic for routine clinical use, and arsenicals should not be given in the presence of a hepatitis. Slight gastric distress has been noted also but no evidence of damage to the kidneys, optic nerve, skin or other tissues has been observed. Liver damage has been reported elsewhere from the use of chiniofon but the authors have abandoned this agent because of its relative inactivity as an amebacide, using vioform in preference to chiniofon. The drug cannot be used rectally because of local irritation. Since the soluble hydrochloride of vioform causes local effects on mucous membranes, it is possible that a gastric hyperacidity may be responsible for the distress experienced. Heptylresorcinol irritates the mucous membranes of the gastroenteric tract and is not to be recommended as an amebacide until more adequate data on its efficiency are available.

Hemenway has used the De Rivas's treatment in twenty cases of dysentery, amebic and bacillary, of which one was unimproved and nineteen cured. All stools contained blood and mucus. The treatment for the eradication of parasites of the large intestine is recommended for amebic and balantidic dysentery, trichomonas, oxyuris and other protozoa and metazoic disturbances of the large intestine. The patient lies on the right side with hips elevated. An ordinary stomach tube is used for insertion into the rectum. This is connected with a glass Y tube, one end of which leads to an enema vessel and the other to a pail. There are stopcocks on both ends. The rectal tube is inserted slowly and sufficient fluid is admitted to balloon out the intestine so that the tube may be pushed up into the ascending and transverse colon. Then a rectal thermometer is inserted. The enema vessel contains 5000 cc. of a 1-5000 solution of copper sulphate at a temperature of from fifty-two to fifty-five degrees (C) which flows into the colon at the rate of 100 to 150 cc. a minute. A patient may be given one to two liters. When the patient complains of pain the enema tube is closed off, that to the pail is opened and some of the solution is drained off from the intestine. After this the treatment may be continued and at its close the patient holds it as long as he can. The treatment is given three times a week for two months and then once a week for a month.

Meleney, H. E.: The pathology of amebiasis. J. A. M. A. 103:1213 (Oct.) 1934.
Magath, T. B.: The laboratory diagnosis of amebiasis. J. A. M. A. 103:1218 (Oct.) 1934.
Reed, A. C., and Johnston, H. G.: Amebiasis among one thousand prisoners. Am. J. Trop. Med. 14:181 (Mar.) 1934.
Anderson, H. H., and Reed, A. C.: Untoward effects of antiamebic drugs. Am. J. Trop. Med. 14:269 (May) 1934.
Hemenway, R. V.: Results of De Rivas treatment in dysentery cases. Chinese M. J. 48:337 (April) 1934.

Idiopathic Ulcerative Colitis

Spriggs summarizes his experiences with chronic ulceration of the colon. He found the incidence to be about five in one thousand admissions. Of forty-eight consecutive cases investigated and observed in detail, thirteen were due to amebiasis. After discussing the symptoms and physical signs of ulcerative colitis, he reports on the value of various kinds of treatment. For the milder cases he advises general hygienic care with a fairly bland diet. He believes that intestinal douching with normal saline is frequently a useful procedure. He did not find that vaccine treatment proved to be beneficial.

Banks and Bargen have found that relapses in chronic ulcerative colitis are most commonly associated with respiratory infection. This was true in fifty-seven per cent of all cases. Next in importance came over-exertion and emotional upsets of which there was an incidence of thirteen per cent. Any condition causing irritability of the tract may be responsible for a relapse. This occurred in twelve per cent. Removal of a focus of infection produced a relapse in five per cent of their cases. They found a greater incidence of the disease in winter and the lowest in June.

Hare points out the resemblance of colitis to a deficiency disorder and urges treatment with high vitamin diets and massive doses of iron and liver. The temporary increase in diarrhea or of other symptoms which often follows at the outset is no contraindication to continuing the treatment. Improvement in the intestinal symptoms may be slow, especially at the beginning of an acute relapse, and perseverance is required. It is urged that all local treatment and sigmoidoscopic examination should be avoided if possible, as the intestinal wall is highly sensitive to trauma. If colon lavage is continued, it may keep up the diarrhea and bleeding and cause apparent failure of other treatments.

Spriggs, E. I.: Chronic ulceration of the colon. Quart. J. Med. 3:549 (Oct.) 1934.
Banks, B. M., and Bargen, J. B.: Relapses in chronic ulcerative colitis. Arch. Int. Med. 53:131 (Jan.) 1934.
Hare, D. C.: Non-specific colitis in relation to deficiency disorders and anaemia. Brit. M. J. 2:162, (July) 1934.

THE COLON

Weber evaluates the different methods of studying the colon by x-ray and concludes that of all the methods the contrast meal taken by mouth is the least satisfactory.

Friedenwald and M. Feldman give the results of their observations on the redundant colon. They discuss the symptomatology, diagnosis and treatment which is aimed to restore the normal function of the bowels as far as possible.

Weber, H. M.: Roentgen diagnosis of diseases of the colon: an evaluation of methods. Am. J. Roentgenol. 31:607 (May) 1934.
Friedenwald, J., and Feldman, M.: Clinical observations on the redundant colon (Dolichocolon). South. M. J. 27:147 (Feb.) 1934.

Hirschsprung's Disease

Telford urges that sympathectomy be done early in cases of Hirschsprung's disease as a good result can be expected only in those cases where the colonic wall is capable of response to the altered innervation. The author is accustomed to divide those rami which pass from the neighborhood of the first and second ganglia to the aortic plexus; by this means he expects to break the sympathetic and preserve the parasympathetic supply.

Bonar presents a method for the temporary treatment of Hirschsprung's disease. He has obtained successful results by rectal instillation of a saturated solution of magnesium sulphate. After instillation the colon has emptied itself completely of enormous quantities of material. (The reviewer would suggest that this may be

a violent means of emptying the colon and some care should be used in trying this procedure.)

Telford, E. D.: Sympathectomy. Lancet. 1:444 (Mar.) 1934.
Bonar, B. E.: Pelvirectal achalasia (Hirschsprung's disease): temporary medical management by rectal administration of magnesium sulphate. Am. J. Dis. Child. 48:123 (July) 1934.

Tumors of the Colon

Runyeon reports a case with rectal involvement by the Krukenberg tumor. The patient, a woman of sixty-four, had had attacks of pain in the epigastrium and right hypochondrium for several years with nausea and vomiting. On physical examination the examiner noted a mass in the epigastrium which he diagnosed as carcinoma of the stomach or gall bladder disease. Four months later she was having frequent attacks of diarrhea, at which time marked constriction of the rectum was found three inches above the anus. This was treated by dilatation. About a year later she died following a perforation in the upper part of the sigmoid. The diagnosis at autopsy was Krukenberg tumor involving the stomach, ileum, appendix, sigmoid, rectum and ovaries. The author believes that the primary lesion was probably in the stomach with metastases to the other organs. The distribution of the lesions in this case would suggest its having been spread by the cancer cells falling from the stomach focus into the organs of the abdomen and becoming implanted there as suggested by Erdheim and Schiller.

Runyeon, F. G.: The Krukenberg tumor: report of a case with rectal involvement producing stricture. J. A. M. A. 103:1199 (Oct.) 1934.

Constipation

R. S. Leadingham discusses the treatment of chronic constipation by means of high fat and low residue diets and very sensibly points out that virtue of this dietetic treatment is probably due to the small amount of cellulose, in patients who have a spastic type of intestine.

Leadingham, R. S.: A high fat, low residue diet in the treatment of chronic constipation. South. M. J. 27:9 (Jan.) 1934.

Mite Infestation

Kampmeier and Hinman report two cases whose gastro-intestinal tracts were infested by mites (tyroglyphus longior). Both were suffering from diarrhea and the parasites were found in the stools. Proctoscopic examinations showed that the mucosa presented a granular appearance with slight infection and there were also petechial-like spots and ulcers of about one to two mm. in diameter. One of the cases had had recurrent attacks with loose bowels with spontaneous cure. The authors believe that the mites were the cause of the diarrhea.

Kampmeier, R. H., and Hinman, E. H.: Mite infestation in the human intestine. South. M. J. 27:271 (Mar.) 1934.

The Rectum

Buie and Brust summarized one hundred cases of high rectal pain and made the following diagnoses: neurosis 1, rectal neurosis 1, chronic nervous exhaustion 26, rectal neuralgia 12, psychoneurosis 12, tabetic rectal crises 8, radium proctitis 5, prostatic disease 6, coccygodynia 1, sacrococcygeal arthritis 2, pelvic tumor 3, adenomyoma of rectovaginal septum 2, cystocele and rectocele 1, chronic pelvic inflammatory disease 1, cause of pain not found 19. In making this study the authors purposely omitted all cases in which there was some primary rectal disorder capable of accounting for the patients' discomfort.

Preusser reports the use of some local anesthetic such as benzocaine in the treatment of spastic anal sphincter following surgical measures for the relief of anorectal disease. The anesthetic is dissolved in sweet almond oil to which a small amount of benzyl alcohol has been added to act as a solvent in the mixture. He says that relaxation of the sphincter occurs almost immediately and continues until the oil is completely absorbed, usually four to seven days.

Lee and Staley found that fourteen out of sixteen patients with rectal stricture gave a positive Frei test for lymphogranuloma inguinale. They believed that the test was supported by the selective localization of the stricture in the region of the chief lymphatic network surrounding the anus.

Morley discusses two cases of complete prolapse of the whole rectal wall that he has treated by injection and he urges that a conscientious trial be made by other rectal surgeons before submitting patients to one of the ordinary operations for rectal prolapse. All operations for rectal prolapse are severe and all are liable to failure. One of the advantages of treatment by injection is that it does not necessitate any confinement to bed. In both of the author's cases there was definite prolapse not merely of internal hemorrhoids but of a considerable length of the whole rectum. Both had toneless sphincters with obliteration of the anal canal and both complained chiefly of incontinence of feces. The author does not suppose that complete relief will be permanent in either case. The technique differs slightly from the method of injection for internal hemorrhoids with phenol in almond oil, in that for the high injection for true rectal prolapse one aims at inserting the needle slightly deeper than the submucous tissue. It should be introduced deeply enough to reach the muscular coat. If this is done successfully the swelling produced by the oil in the submucous tissue does not appear to the same extent and the "striation sign" that enough has been injected at any particular spot

does not occur. One is reduced to guess at the correct amount. The author has usually injected from two to three cc. at each puncture. The aim is to inject all around the rectal wall. If one feels the rectum from the vagina after two or three treatments the whole intestine feels hard and the sensation closely resembles that produced by an annular carcinoma of the rectum when felt from the vagina. All this thickening disappears three or four weeks after the completion of the treatment. This inflammatory process results in close adhesions of the mucous and submucous coats to each other and to the muscular coat. This in itself prevents the intestinal wall from prolapsing and, moreover, the submucous space being more or less obliterated, the main hemorrhoidal vessels that feed the piles are compressed and the hemorrhoids are cured in that way.

Buie, L. A., and Brust, J. C. M.: High rectal pain: an analysis of one hundred cases. Am. J. Digest. Dis. & Nutrition. 1:591, 1934.
Preusser, W. F.: Control of the spastic anal-sphincter. Am. J. Surg. 25:327 (Aug.) 1934.
Lee, H., and Staley, R. W.: Inflammatory strictures of the rectum and their relationship to lymphogranuloma inguinale. Ann. Surg. 100:486 (Feb.) 1934.
Morley, A. S.: Injection treatment of complete rectal prolapse: report of two cases. Brit. M. J. 2:204 (Aug.) 1934.

THE APPENDIX

Clavel and Colson have made a careful study on the so-called double appendix. There has been one case which they have personally observed and they report on three other cases. They first discuss whether the double appendix is a real anomaly or the result of faulty observations. They state that the following requirements are needed for diagnosis of true double appendix: (1) The existence of different coats, particularly muscular; (2) The existence of a double cecal implantation; (3) The existence of a vascular supply analogous to a normal appendix. As a result of their studies they conclude that the double appendix may be a true congenital anomaly.

Goldberg and Nathanson point out that an acute mesenteric lymphadenitis may give a picture similar to that of acute appendicitis. They report the results on sixteen surgical cases in which the appendix was grossly normal. Five of these cases showed fluid present in moderate quantities. Enteritis of some degree was not infrequent. They stated that the etiology is not known but suggest that the condition may be due to a streptococcic involvement coming from the throat. (All of us have probably seen similar types of cases at one time or another but it is something that is easy to forget and it seemed worthwhile to abstract this report.)

St. John discusses the condition called fibroblastic appendicitis which was first described by Laewen in 1914. The author feels that it probably occurs more frequently in those individuals having a special disposition to react to chronic irritation by the production of abundant connective tissue.

Vance reports three cases of primary carcinoma of the appendix and states that 0.5 per cent of all appendices removed show evidence of carcinoma. Metastases have been reported nine times in the literature. Usually the condition is benign. Two types of cells are recognized, spherical round cell or a basal type, and columnar or adenomatous type. The condition is never diagnosed preoperatively.

Several excellent studies have been made on acute appendicitis. Wevill and Wallace have studied eight thousand cases in English hospitals and find that the number of admissions has increased considerably in the past few years. The number of cases requiring drainage has steadily decreased. The general mortality in their series was 4.5 per cent. This is probably a slight decrease in the mortality rate during the past ten years, although for the past four years it has been steady.

As a result of his studies at the Boston City Hospital, Walker concludes that there has been an increasing number of deaths. It is his impression that the disease is on the increase.

Clavel, C., and Colson, P.: A study on the double appendix. Ann. d'anat. path. 11:157 (Feb.) 1934.
Goldberg, S. L., and Nathanson, I. T.: Acute mesenteric lymphadenitis. Am. J. Surg. 25:35 (July) 1934.
St. John, V.: Fibroplastic appendicitis. Am. J. Surg. 25:243 (Aug.) 1934.
Vance, C. A.: Primary carcinoma of the vermiform appendix. Am. J. Surg. 24:854, 1934.
Wevill, L. B., and Wallace, H. L.: Acute appendicitis. Edinburgh M. J. 41:557 (Oct.) 1934.
Walker, I. J.: Why the increasing mortality in appendicitis? Am. J. Surg. 25:228 (Aug.) 1934.

(The End)

PHYSICIANS AS ANESTHETISTS

Dr. Goldwater, Commissioner of Hospitals for New York, has announced that only graduates in medicine will be permitted to administer anesthetics in Bellevue Hospital. This move is to displace nurse technicians who have been doing this work.

If this plan proves to be successful, it will be adopted in twenty-five New York City Hospitals. One purpose in this experiment is to teach internes in this department of medical service, and thus prepare them for specialization in this field. Incidentally, Dr. Goldwater expects to demonstrate more efficiency, as well as economy.

A WARNING TO SURGEONS

The *New York Times* reports, in substance, that John Edgar Hoover, Director of the Federal Bureau of Investigation, will prosecute surgeons who alter the finger ends employed in making prints, and the features of criminals.

Such technical plastic surgery will be construed "as conspiring to harbor, or harboring, the fugitive". The full article appears in a recent issue of the *American Journal of Surgery.*

VERMONT STATE MEDICAL SOCIETY

PHYSIOLOGY, PATHOLOGY, AND TREATMENT OF CRANIOCEREBRAL INJURIES*

BY WINCHELL MC K. CRAIG, M.D.†

THE pathologic and physiologic effects of craniocerebral injuries depend not only on the severity of the trauma and the extent of the lesion, but also on the proper type of treatment. Preventive medicine is receiving a great deal of attention at the present time; consequently, we are becoming more interested in the most effective methods of treatment. This is especially true of the treatment of injuries of the head, which frequently are followed by latent disabilities.

It is rather discouraging to note that 80 per cent of craniocerebral injuries are followed by definite post-traumatic symptoms. Glazer has analyzed a large series of cases in which there were post-traumatic symptoms, and has discovered that headache occurred in 67 per cent and dizziness occurred in 60 per cent. The very troublesome and incapacitating nervous fatigue, which is associated with insomnia and visual disturbances, occurred in 30 per cent. Probably the most distressing fact was the occurrence of post-traumatic epilepsy in 6 per cent of the cases in Glazer's series. This unfortunate sequel has been reported to occur in as many as 12 per cent of craniocerebral injuries. The scope of these latent post-traumatic disabilities is understood more easily when we review the problem of injuries to the head, from the standpoint of the number of accidents that occur annually.

In discussing this problem, Mack reviewed the total number of accidents that occurred in 1929 and placed the figure at 3,705,000. The public accidents, which were chiefly caused by the automobile, numbered 1,085,000. Industrial accidents numbered 2,620,000. The total number of accidental deaths in the United States was 51,000, for the year 1929, and the approximate number of deaths, which resulted from fractures of the skull in the United States was 25,000 and the average mortality for craniocerebral injuries was 25 per cent. The approximate number of fractures of the skull, which occur annually in the United States is around 112,000. In view of the fact that the mortality for craniocerebral injuries is 25 per cent, I should like to discuss not only this group in which the patients die, but also the remaining 75 per cent of cases, in which 80 per cent of the patients who survive have post-traumatic symptoms. In reviewing the pathology of craniocerebral injuries, we must recognize that, in the more extensive injuries, the cerebral hemispheres are injured irreparably. However, it is very encouraging and interesting to note that post-traumatic edema probably plays a greater part in the production of serious symptoms than does laceration of the brain, or hemorrhage. It has been ascertained that the first forty-eight hours following craniocerebral injuries is the period in which most fatalities occur; it also has been determined that the mortality is 66 per cent for cases in which the patients are unconscious at the time of their admission to the hospital, whereas in cases in which the patients are conscious at the time of their admission, the mortality is only 7 per cent. In view of the fact that post-traumatic edema plays a very important part in the course of the illness, and inasmuch as this post-traumatic edema can be treated satisfactorily, we must assume that effectual treatment, which is instituted at the proper time and which is carried out over a sufficient time, should not only reduce the mortality but should also prevent such a high incidence of post-traumatic symptoms, or, at least, should decrease their severity, and should tend to prevent the occurrence of convulsions and total disability.

It has been assumed that the most important clinical factor in craniocerebral injuries is the amount of injury that may be disclosed by the Roentgen rays, but this is only of medicolegal importance; it has been recognized for a long time that fractures of the skull are no indication of the extent of the cerebral injury and that roentgenologic examination of the skull is only one part of the examination that is necessary to determine the exact condition of the patient. The vascularity of the meninges, especially those which are situated about the sinuses and at the base of the brain, makes intracranial hemorrhage a distinct hazard, and in spite of the stabilizing influence of the falx cerebri and the tentorium cerebelli, it is evident that any blow to the head may tear the meninges or may injure the cerebral cortex. In roentgenologic examination of all craniocerebral injuries the surgeon is impressed by the number of linear fractures which are not associated with any disability. If these are treated by prolonged rest in bed, there is little tendency

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for the unpleasant post-traumatic symptoms to develop. Therefore, in view of the fact that the roentgenologic examination of the skull is not an index of the underlying pathologic and physiologic changes, which are present within the brain, it is necessary to keep these patients under very close observation and frequently to record the pulse rate, the blood pressure, the temperature, and the respirations. A definite record also should be kept of the state of consciousness of the patient; the extremities also should be examined to determine whether there is any loss of motion.

Fractures of the skull may be linear or depressed, and sometimes it is difficult to demonstrate definite depression by the roentgenogram. A depressed fracture may involve both the inner and the outer tables, and it may be either simple or compound. A linear fracture, which extends into the base, may be associated with more serious clinical symptoms than occur with a compound, depressed fracture of the vault. Compound depressed fractures require surgical treatment, and serious considerations also should be given to the surgical treatment of simple, depressed fractures because it is difficult to demonstrate fragmentation of the inner table with the roentgen rays, and these fragments may have perforated the dura.

Aside from the extensive compound and depressed fractures that produce craniocerebral injuries, the most disabling phase probably is the result of concussion and contusion of the brain. The term "concussion" is very indefinite and, for that reason, has created a controversy among members of the medical profession. The reason for this is that, in reality, it is a physiologic, and not an anatomic, lesion, and no pathologic changes can be demonstrated at postmortem examination. Concussion usually carries with it the idea of temporary unconsciousness which follows a blow on the head. This loss of consciousness has been attributed to anemia of the brain, to a chemical change which involves both the lipoids and the protein molecules, and to interruption of the synaptic junctions of the subcortical centers within the midbrain. According to the latter explanation, the mechanism which is responsible for the temporary loss of consciousness that occurs in concussion, may be compared to the jar which disconnects the switch that controls the lights on an automobile. The symptom-complex which is signified by concussion usually consists of immediate and temporary unconsciousness that generally is followed by headache, nausea, and vomiting. The clinical course is featured by rapid recovery from all symptoms, although patients who have died following injury to the head have disclosed no gross lesions at necropsy. Concussion may affect either the cerebrum or the medulla oblongata; it is more serious when it involves the latter. Prize fighters who are knocked out probably suffer from concussion which affects either the medulla oblongata or the cerebrum. An interesting condition which has been called "punch drunk", has been observed among prize fighters. These individuals become troubled by ataxia, incoördination, some spasticity, and mental changes, all of which probably result from repeated concussion with petechial hemorrhages, which are scattered throughout the brain. Clinically, it is important to recognize cerebral concussion because proper treatment should be instituted to prevent the development of sequelae.

The development of edema in the cerebral tissues is very closely associated with concussion of the brain. Pathologists have recognized this condition as the most frequent change, which is discovered in the brain at postmortem examination of patients who have died as a result of concussion. The gross pathologic findings consist of convolutions which are flat, with cerebral veins, which are relatively empty, with subarachnoid spaces, which contain a diminished amount of cerebrospinal fluid. Microscopically, the perivascular lymph sheaths are discovered to be distended, and the water content of the brain has been disclosed to be greatly increased. The exact physiologic explanation of the development of post-traumatic edema is still speculative, although it has been demonstrated that edema occurs when there is an increase of colloids in the tissues. This increase of colloids is caused by an increase in acidity; it has been demonstrated that patients, who are recovering from concussion and contusion of the brain, excrete in the urine an increased amount of lactic acid, acetic acid, and phosphoric acid. Regardless of the cause, it is an accepted fact that the majority of symptoms which occur in craniocerebral injuries are results of increased intracranial pressure, which in the great majority of cases is the result of associated cerebral edema. When we realize that the brain is enclosed in a non-expanding shell, that edema is the most common cause of increased intracranial pressure, that increased intracranial pressure results in interference with the venous return from the brain, and that this last hinders absorption of cerebrospinal fluid, it is clear that even the slightest injury of the head, which produces edema, may result in serious clinical conditions unless proper treatment is instituted.

Contusion of the brain usually indicates localized injury to the cerebrum. It frequently is the cause of death. In contrast to concussion, the symptoms of contusion usually develop after a latent period, which may last for hours or days. Contusion is associated pathologically with varying degrees of hemorrhage, which are usually small and petechial in type. The localized changes which occur at the opposite pole of the skull constitute another factor in contusion; this usually is spoken of as contrecoup injury.

These contrecoup lesions may explain bilateral symptoms or clinical symptoms which indicate that the lesion is on the side opposite to the site of the injury. Lacerations of the meninges and of the cortex usually occur with depressed fractures, although severe head injuries without fracture have caused tearing of the meninges and cortex. Intracranial hemorrhage, which is the result of craniocerebral injuries, may be of two types, according to their situation: intradural or extradural. Hemorrhage probably occurs in every severe craniocerebral injury and may, or may not, play a part in the development of disabling sequelae. The most alarming hemorrhage, which may occur following injury of the head, is that which is associated with injury of the middle meningeal artery. The resulting symptoms are usually those of increased intracranial pressure, and develop after a latent period.

The symptoms that follow craniocerebral injury seldom indicate that the patient is suffering independently from concussion, edema, contusion, or hemorrhage, but indicate that a combination of these lesions usually is present. A more useful classification for treatment of craniocerebral injuries therefore has been adopted. This consists of: (1) slight injury with few symptoms and recovery under expectant treatment, (2) indeterminate injury with variable symptoms, in which treatment depends on developments which arise during observation, and (3) severe injury with pronounced symptoms and no response to treatment. In classifying craniocerebral injuries in this manner, the fact must be accepted that no matter how slight an injury may be, it always can be followed by severe sequelae, and that no injury is so extensive that recovery may not occur with the proper treatment. Keeping in mind this classification and the fact that our object is not only to bring about recovery of the patient but also to accomplish this with as few post-traumatic sequelae as possible, the proper treatment will be considered.

All patients, who are suffering from shock when they are first seen, should be treated for shock before any extensive examination is carried on. Following their recovery from shock, a complete general examination for associated injury should be made. This should include repeated estimations of the blood pressure, and the rate of the pulse should be recorded frequently. A complete neurologic examination should be made to determine the amount of disability that has been produced. As soon as the patient is able, a roentgenologic examination of the skull should be made; this should include anteroposterior, and lateral roentgenograms. The neurologic examination should include a lumbar puncture and examination of the cerebrospinal fluid. When a patient who has suffered an injury of the head is subjected to lumbar puncture, the pressure of the cerebrospinal fluid should be measured with the manometer. A lumbar puncture serves two purposes: (1) it enables the surgeon to estimate the pressure of the cerebrospinal fluid, and (2) the presence of blood may be determined by either gross or microscopic examination. There is a great difference of opinion with regard to the therapeutic value of spinal drainage following injuries of the head, but it has been demonstrated experimentally that blood in the subarachnoid space definitely interferes with the absorption of the cerebrospinal fluid by collecting and coagulating around the arachnoid villi. Spinal drainage removes the blood from the subarachnoid space and tends to avert post-traumatic symptoms by preventing any alterations in the circulation of the cerebrospinal fluid. Spinal puncture should not be done in all cases. Spinal drainage should be instituted only in those cases in which there is evidence of blood in the subarachnoid space, and never should be employed until manometric readings demonstrate that the danger from increased intracranial pressure is not too great.

The proper treatment for concussion is rest in bed with careful observation for changes in pulse, blood pressure, and size of the pupils; the surgeon also should watch for the development of paresis or anesthesia, which indicates more serious complications. The treatment of cerebral edema consists of limiting the intake of fluids, of the administration of enemas of magnesium sulphate, of the intravenous injection of dextrose, and of the employment of spinal drainage. In the treatment of craniocerebral injuries, rest has probably never been stressed enough. A fractured femur is placed in a cast until union has occurred, a sutured nerve is protected and supported until regeneration has taken place, but a patient who has an injured brain is allowed to get out of bed in a very few days, and as a result, delayed post-traumatic headaches, vertigo, general malaise, and so forth, develop. In the treatment of injuries of the head, patients should be kept in bed for three weeks in order to prevent these disabling sequelae. This period of rest should be coupled with frequent observation of both the rate of the pulse, and the blood pressure. If edema is present, the intake of fluids should be limited; spinal drainage should be employed if there is blood in the subarachnoid space, and dextrose should be administered in hyperosmotic solution for the relief of shock and increased intracranial pressure. With the observance of these measures, it is possible to lower the mortality and to reduce the incidence of disabling post-traumatic sequelae. The cases in which surgical treatment is required are those in which

there are lacerations of the scalp and compound or depressed fractures of the skull. A patient who has suffered concussion occasionally may have to be subjected to subtemporal decompression, and latent symptoms, which develop under observation, certainly should suggest hemorrhage from the middle meningeal artery, and operation should not be delayed. Cases sometimes are observed in which the cerebral injury does not seem to be so great as is cerebral irritation, and the symptoms vary from mild restlessness to those of a manic state. There is probably no more efficacious sedative for quieting these patients than the barbiturates; the intravenous administration of sodium amytal and the rectal administration of pentobarbital sodium in perforated capsules is useful to quiet these patients. In observation and treatment, it is sometimes necessary to carry out feedings by the intranasal tube, and patients who have been fed for as long as two weeks in this manner have completely recovered.

One of the most important of the sequelae, which follow craniocerebral injuries, is the so-called chronic subdural hematoma, or pachymeningitis hemorrhagica. In this condition, the symptoms generally develop in from two weeks to six months following the injury to the head. Usually, the injury is more or less trivial and the patient has received little, if any, treatment. The onset of the subdural hematoma is insidious and the symptoms generally consist of headache, vertigo, change of personality, or increased intracranial pressure. The condition frequently simulates a tumor that is situated deep in the brain, and many of these cases are discovered in the course of ventriculography. At operation, an encapsulated collection of liquid blood is discovered beneath the dura; this compresses the brain. The clinical relief, which follows operation, is usually dramatic and is featured by the disappearance of all symptoms and by the sudden return to normal. The treatment consists of either washing out the clot by means of multiple openings which have been made with the trephine or of reflecting a small flap and evacuating the clot. The mortality is high in these cases if the condition is not recognized early and the patient operated on; therefore, the condition should be kept in mind whether signs of increased intracranial pressure develop or in every case in which there is intracranial derangement following even a slight injury to the head.

Probably the later developments which indicate pathologic and physiologic changes that have taken place in the brain over varying periods of time constitute the most distressing phase of craniocerebral injuries. These are evidenced by mental retardation, emotional instability and convulsions. In order to distinguish between the functional and the organic factors, encephalography has been of extreme value. This procedure consists of the injection of air into the subarachnoid space, through a lumbar puncture needle. By draining the subarachnoid space and the intraventricular spaces, and by injecting air, the different markings in the roentgenograms will disclose the atrophic and degenerative changes which have taken place. Encephalography is not only of extreme diagnostic importance in these old cases of injury to the head but it also is frequently of therapeutic value in relieving the headaches, in lessening the severity of the attacks of grand mal and petit mal, and in improving the general condition.

A complete discussion of craniocerebral injuries becomes so involved that it is impossible to cover all points, but if the proper recognition is acquired and treatment is carried out in every case, regardless of how trivial or how severe, the mortality will be lowered and the development of disabling post-traumatic sequelae should be diminished, even including the incidence of post-traumatic epilepsy.

NOTICE

Preliminary cards have been forwarded to members of the Vermont State Medical Society notifying them of the Clinical Meeting to be held by the Vermont State Medical Society and the Medical Department of the University of Vermont jointly on May 3 and 4 at the Mary Fletcher Hospital in Burlington. Doubtless the regular program will have been received by the time this notice appears in print.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.

CASE 21171

PRESENTATION OF CASE

A fifty-five year old Irish widow was referred to the House from the Out Patient Department because of jaundice.

One and a half years before entry the patient was first seen in the Ear Clinic because of marked ringing in the ears for several months. Upon examination a large perforation of the nasal septum was found. Transillumination of all the sinuses showed dullness. A routine Hinton test was positive. The Wassermann was negative. She was transferred to the Skin Clinic where repeated Hinton tests were positive and Wassermann tests negative. A lumbar puncture was negative. Three months later she was put on a course of bismuth; she was given 15 injections, the last one approximately one year before admission. She was then put on potassium iodide and mercuric chloride until six months before entry, at which time neoarsphenamine treatments were begun. She was given ten injections, three-tenths of a gram each, the last one four and a half months before entry. This was followed by 15 injections of bismuth, two-tenths of a gram each, over a period of three months. A Hinton test at that time was reported as doubtful. She was then discharged from the clinic and told to return in three months, during which period she was to take mercuric chloride, one-sixteenth of a grain three times a day.

Four weeks before admission she became nauseated and vomited everything she ate. This was associated with a heavy feeling of discomfort in the epigastrium when food was eaten and also a dull steady pain around the umbilicus. The vomitus consisted of unchanged food but no bile or blood. She became very constipated. One week later jaundice was first noticed and during the following week it became more marked. She also noticed that her urine was dark and that her stools were light colored. She remained in bed for three days on a diet of water, milk, orange juice and custard. The jaundice began to wane and she returned to the Skin Clinic and was then admitted to the House.

She had been married thirty-five years. Her husband died eleven years ago from pneumonia. There were no miscarriages or stillbirths. One child was living and well. There was no history of venereal disease.

Eighteen years ago she had a left-sided pleurisy with effusion and spent seven months in a sanatorium.

Physical examination showed a well-developed and nourished, markedly jaundiced woman. There was a large perforation of the nasal septum. The left supraclavicular region was full and slightly firm. The lungs were clear. The heart was not enlarged. There was an unusually loud, booming aortic second sound, a soft blowing systolic murmur at the apex and along the left border but no diastolic murmur. The blood pressure was 114/70. The liver was felt three fingerbreadths below the costal margin by two observers, but was not felt by others. The liver dullness extended up to the fifth rib. The edge was sharp and non-tender. The spleen was not felt. The ankle jerks were not obtained. The right knee jerk was slightly sluggish and weaker than the left.

The temperature was 98.4°, the pulse 90. The respirations were 25.

The urine was brownish red in color, had a specific gravity of 1.020 and gave a positive test for bile. The red blood cell count was 4,540,000, with a hemoglobin of 90 per cent, the white cell count 9,000, 81 per cent polymorphonuclears. The stools were yellow and two out of four gave a positive guaiac test. A Hinton test was positive and a Wassermann negative. The van den Bergh was 22.5 milligrams per 100 cubic centimeters direct. The nonprotein nitrogen was 31.

X-ray examinations done both in the Out Patient Department and in the House showed a diaphragmatic hernia which was fixed in the chest and which could not be reduced. With the patient lying on her stomach there was a definite splitting of the barium at the junction of the middle and lower third of the stomach. This filling defect was also noted with the patient lying on the back and in the right and left oblique views. In the lateral view no filling defect within the stomach could be found. The mucosa of the stomach showed a marked thickening and distortion. The duodenal cap was normal. There was a diverticulum in the duodenal-jejunal junction. A chest plate showed that the transverse diameter of the heart was increased. The supracardiac shadow was at the upper limits of normal.

She was given large amounts of intravenous glucose. Her temperature remained fairly flat until approximately two weeks after admission, when it rose to 101°. She developed marked ascites and anasarca. There were only a few râles at the bases. The liver could not be felt. Her breath had a definite "mousey" odor. She rapidly failed and died two days later.

Differential Diagnosis

Dr. Charles L. Short: The story of the patient's course in the Out Patient Department up to four weeks before entry may be said to represent the preliminary events leading up to the fatal illness. She came to the Ear Clinic and a Hinton test was done, undoubtedly on account of the perforated septum. We are not told how long she had it or whether there was a history of trauma or an abscess there. Repeated Hinton tests were positive, with Wassermanns negative. I believe this is not infrequently the case in late syphilis, and we have no reason to doubt that she did have syphilis whether Dr. Mallory will be able to demonstrate it or not. She was given a conservative course of treatment, first bismuth, then mercury, then neoarsphenamine, about ten injections in small doses, the last one about three and a half months before the onset of her fatal illness. This was followed by bismuth and mercury.

The story of the next four weeks is certainly consistent with the gradual onset of hepatogenous jaundice. She was not very sick for she remained in bed only three days. The observation, probably by her family, that the jaundice was beginning to wane I do not believe can be depended upon. Her family history and past history do not seem to be of importance in the present situation.

The important points in the physical examination are the marked jaundice, the cardiac findings and the palpable liver. The non-tenderness of the liver edge is said to be in favor of so-called arsphenamine jaundice rather than infectious or catarrhal jaundice, where the liver is more often tender. The reflex findings may indicate a latent tabes although the lumbar puncture findings were normal.

She had no anemia. The white count, which is slightly above normal, with moderate polymorphonucleosis, is again said to be in favor of arsphenamine jaundice as distinguished from infectious jaundice. She had two out of four positive guaiac tests in the stools, and the van den Bergh confirmed the intensity of the jaundice.

In summary, then, we have a patient with latent syphilis developing severe liver damage about three and a half months after the last injection in a course of neoarsphenamine which had been preceded by and followed by a course of bismuth and mercury.

X-ray Interpretation

Dr. George W. Holmes: I will take the chest films first. This is the anteroposterior view of the chest to show the size and shape of the heart. There was also a fluoroscopic study. The patient is a luetic and of course we would naturally look for changes in the aorta. Her supracardiac shadow is slightly increased. There is a slight prominence of the ascending portion of the aorta, and the aortic knob is not so prominent as one would expect in a patient of this age. All of these three things that I have mentioned are findings that accompany luetic aortitis, but none of them are conclusive. In the oblique view of the chest we get a rather better view of the aorta and it does not seem to be dilated in the visible portions. The ascending portion might have some dilatation but in the transverse and descending parts it is not dilated. Here is a little better view. We can see that the aorta, as it passes over to the left and down on that side, is not particularly remarkable. So far as our examination of the chest goes we have evidence that is a little suggestive of slight dilatation of the aorta but not enough to make a diagnosis.

In the examination of the gastrointestinal tract this film shows the hernia of the stomach through the diaphragm. Here you see the level of the diaphragm. This is the partially filled stomach and in this area the mucosa has a definitely abnormal appearance. It is granular in appearance. The usual lines are not present and it looks like a rather large lesion on the lesser curvature or posterior wall, not very far from the pylorus. Here is the diverticulum of the duodenum mentioned. This is the duodenal loop and at that point you see the small diverticulum. Here are a number of films that show the detail of the involved area in the stomach. Here is a film where the stomach is nearly empty. This is the pylorus. That would be the point of the lesion. Here are some small films centered directly over the lesion and you can see a deformity of the barium shadow. It looks almost like an ulcer, a large shallow ulcer crater. This is the pyloric end of the stomach. This the lesser curvature and here the involved area. The barium projects from the shadow of the stomach in a manner suggestive of an ulcer crater but it is not characteristic.

Dr. Short: Do you think it is of any significance that the filling defect could not be seen in the lateral view?

Dr. Holmes: I think it is important that we are not able to demonstrate clearly a crater. The x-ray shows a definite lesion but the appearance is not that of a polypoid mass, rather that of an indurated area with irregular surface and abnormal mucosa, without positive evidence of an ulcer.

Differential Diagnosis Continued

Dr. Short: In evaluating the x-ray findings I think we can consider the diaphragmatic hernia as incidental to the cause of the patient's death. She had had no gastrointestinal symptoms except those immediately preceding the onset of her illness. I suppose that the gastrointestinal x-rays were taken because the dia-

phragmatic hernia was seen when she was given barium to demonstrate the aorta. I do not know any other reason for it. She had no anemia as is sometimes found in cases of diaphragmatic hernia. The fact that the hernia was irreducible may mean that it was of the so-called short esophageal type. I think we can also pass over the diverticulum of the duodenum as of very little importance. The filling defect in the stomach has to be considered more carefully. There is apparently a definite involvement of the stomach wall as shown by the thickening of the mucosa. I do not think we can assume that this is an extraneous mass pressing on the stomach, although that might be thought of due to the fact that the defect was not present when the patient was seen from the side. I do not think the findings in the stomach permit us to draw a definite conclusion from the evidence at hand. It is possible of course that she had a benign or malignant tumor there. It is possible that she had a gastric ulcer. There have been a few cases of gastric ulcer reported along with diaphragmatic hernia. Then she may have had, of course, syphilis of the stomach. I think the important thing is whether we can link up the gastric lesion with the jaundice and death. If she had had either an intrinsic tumor of the stomach or an extraneous tumor, say of the pancreas, pressing on the stomach and giving this picture, I do not believe that her course would have been as described in the history. I think the rapid downhill course, the ascites and apparent shrinkage of the liver would be against obstructive jaundice or metastatic disease of the liver. We should expect a more gradual course with unchanged size of the liver or increase in size. She had no anemia, and the positive guaiacs in the stools could be explained either on the basis of the diaphragmatic hernia or due to the bleeding tendency existing in deep jaundice.

I think it is fair to conclude that this patient died from acute liver cell destruction, so-called acute yellow atrophy. Ascites and anasarca are not uncommon in this condition. I remember one patient, who died of acute yellow atrophy following the taking of arsphenamine, who was thought to be a cardiac on admission to the ward because the ascites and anasarca overshadowed the presence of jaundice.

The relationship of antiluetic drugs to liver damage is a debatable question. Bismuth rarely seems to be the cause of liver damage and practically never is associated with jaundice unless the bismuth has been preceded by a course of arsphenamine. The same thing can be said of mercury. The interval of three and a half months is not unusual in the cases of so-called arsphenamine jaundice reported. Of course an infectious jaundice might supervene in a patient receiving antiluetic treatment, and, similarly, an acute yellow atrophy occurs rarely in untreated syphilis. It is true that the incidence of arsphenamine jaundice runs quite parallel to the incidence of liver disease in patients not treated with arsphenamine. This has been brought out in some studies made in the German Navy over a period of years*.

There is possibly a combination of factors at work here. A patient with syphilis treated with a drug known to be stored in the liver and an occasional liver poison may be more susceptible to any infectious process. I do not think we can answer this question until the etiology of infectious jaundice is known.

The question then comes up, Did she have syphilis of the aorta? There are no clinical symptoms mentioned. She had neither dyspnea nor pain. The aortic second sound was loud and booming in a patient who did not have hypertension. The x-rays give no clear cut evidence. I think we would be justified in making this diagnosis if there had been a definite dilatation of the aorta in the oblique view. With the evidence that we have, we certainly can suspect it and the aorta is the most likely place in the body that Dr. Mallory will be able to demonstrate the evidence of syphilis. There is no question, I think, that she had a diaphragmatic hernia, that she had syphilis which very probably can be demonstrated in the aorta, and that she died of acute yellow atrophy of undetermined etiology but with syphilis, arsenical treatment and possibly an unknown infectious factor all playing a rôle. The x-ray findings in the stomach I believe are incidental and any explanation of them would rest on speculation at least.

I cannot connect them with the cause of her death.

Clinical Discussion

Dr. Frederick T. Lord: I saw this patient in the ward. The case presentation fails to give a complete picture of the general condition which was obviously very poor. She presented the appearance of a seriously ill patient. She was apathetic, intensely jaundiced, with nausea and vomiting.

Our reasoning with respect to the diagnosis was much like Dr. Short's. We considered the possibility of partial obstruction from stone in the common duct. Though she had some pain in the region of the navel, it was not severe and was not typical of a gall stone attack. Stone in the common duct did not seem a likely explanation.

Malignant disease of the stomach with secondary involvement of the liver was also considered and gastric analysis would have been desirable, but she was pretty ill to be put through even that procedure. The rapid development and severity of the symptoms are against malignant disease. The blood in the stools is difficult to explain, but may be due to passive congestion of the gastrointestinal tract from obstruction in the portal system.

*Ruge, H.: Dermat. Wchnschr. 94: 278, 1932.

From the history of syphilis and the use of arsphenamine, the diagnosis would seem to be subacute yellow atrophy. With respect to the physical findings, I may say that I was one of those who did not succeed in feeling the liver or the spleen.

The development of ascites is interesting and, as Dr. Short has said, a certain proportion of patients with yellow atrophy develop ascites. If the diagnosis of yellow atrophy is right, it would be interesting for Dr. Mallory to tell us if there is any evidence of syphilis of the liver, because of the assumption that in certain persons damage to the liver from arsphenamine arises on the basis of previous injury by syphilis as a predisposing cause. One other aspect of the problem is the history of pleurisy which would suggest that the patient might have had a tuberculous pleurisy but this is probably of no moment in connection with the present problem.

Dr. Arthur W. Allen: I saw this patient in consultation four days prior to her death at which time she obviously was too ill to consider any surgical procedure, even if there had been any feeling from her history or her physical signs that would have led me to believe that surgery would offer any help. The two possibilities of course that we thought of from the surgical standpoint under these circumstances are malignancy affecting the head of the pancreas, causing jaundice, in which case a cholecystgastrostomy usually gives a considerable respite from symptoms, and common duct stone. But her story of so little pain was certainly not one that would lead us to believe that her jaundice was due to common duct stone, also right straight through the time of her stay in the hospital she continued to have some bile coming through into the intestine. I felt that the story, the physical signs and the appearance of the patient were so overwhelmingly in favor of toxic jaundice of some sort that surgery was contraindicated.

Dr. Austin W. Cheever: I feel that it was probably due to the arsphenamine that she died because it fits in so well with the cases as we see them where arsphenamine is given and followed in the old days by a course of mercury, sometimes intramuscularly, sometimes by mouth, and of late bismuth intramuscularly, and then, only not quite so long as this but some weeks after the arsphenamine, the patients develop jaundice from which usually they get well. In this case she did not.

Dr. E. L. Oliver: I have very little to add. If this is arsphenamine jaundice, which I believe it is, it brings up the question whether we should use arsphenamine in old cases of lues. This woman was fifty-five years old and I rather question whether any of the arsphenamine group was indicated. In old syphilis dating back twenty years or more we should be very cautious in using it. We have had a good many of these cases of hepatitis and even in the cases that get well it is probable that the liver is damaged and life shortened more than it would have been from syphilis. I feel we ought to judge such cases very carefully before arsphenamine is given. The chances are that with bismuth and iodine she would not have developed this hepatitis which in all likelihood caused her death.

Dr. C. M. Jones: I would like to add one thing. The fact that she had ascites probably rules out the possibility of a surgical condition. Dr. Vincent pointed that out several years ago when we had three cases of acute yellow atrophy in rapid succession. Each one was considered as a surgical emergency and no one could explain the fact that they had ascites. Dr. Vincent rightly said that it was probably due to intrahepatic disease. Since then we have seen a good many of them. It is a fairly common finding, and when present rules against the surgical causes of jaundice such as stone in the duct.

Clinical Diagnoses

Subacute yellow atrophy with ascites and edema of the legs.
Aortitis.
Late lues, treated.

Dr. Charles L. Short's Diagnoses

Toxic hepatitis—Acute atrophy of the liver.
Diaphragmatic hernia.
Syphilis.
? Luetic aortitis.

Anatomic Diagnoses

Acute atrophy of the liver (? arsphenamine).
Syphilis of the liver, healed gumma.
Icterus.
Ascites.
Diaphragmatic hernia.
Hemorrhagic bronchopneumonia.
Chronic fibrous pleuritis, bilateral.
? Lipoma of stomach.

Pathologic Discussion

Dr. Tracy B. Mallory: The autopsy in this case disclosed a greatly shrunken liver weighing only a little over 800 grams which microscopically shows acute necrosis throughout the organ with practically no regeneration, in other words a typical picture of acute atrophy of the liver. There was one other significant finding, however, a deep indentation in the middle of the right lobe at the base of which was a dense band of scar tissue. I think there is every reason to believe that probably represents a healed gumma since the other changes in the liver were all obviously of very short duration, in fact unusually acute, whereas this lesion was

of many years' duration. A healed gumma would be the most logical explanation for the condition.

The rest of the body showed no evidence of syphilis except of course the perforated nasal septum which had been observed clinically. The ascending aorta was slightly dilated but showed nothing pathognomonic of syphilis. The descending aorta was normal in diameter. The aortic valves showed a small amount of calcification and roughening such as one commonly sees in elderly people. The pleural cavities had been obliterated by old fibrous adhesions. The lungs contained numerous hemorrhagic foci. There was a large hernia through the diaphragm of course. The lesion which had been seen in the gastric mucosa was a localized elevation of the mucosa about three centimeters long and a little over a centimeter wide, over a cluster of fat cells in the submucosa; but there was no trace of ulcer and nothing to suggest any neoplastic change, unless the lesion is to be interpreted a lipoma.

I would like to disagree with the authority quoted by Dr. Lord on the question of limitation of atrophy after arsphenamine to luetic cases. I have recently seen a patient go through what was undoubtedly a mild attack of acute yellow atrophy following arsphenamine treatment for Vincent's angina.

DR. LORD: May I correct your interpretation? It was not my contention but it has been contended.

DR. MALLORY: Dr. Cheever, I wonder if you have any opinion of this question of toxic jaundice following arsphenamine. Stokes of the Mayo Clinic and Ruge in Germany have both published some fairly large statistical studies.

DR. CHEEVER: There was a time several years ago when there was a great deal of jaundice here in Boston. Some of us in the South Medical (syphilis clinic) and Medical services got our heads together and found there was a definite rise in both departments so that the curve of increase and later on the curve of decrease were parallel. In the South Medical we were having a higher percentage of cases with jaundice than the Medical. I think there was something going around that played a part along with the antisyphilitic treatment. Also, there is something in the method of making the drug, I believe, because back at that time when a single make was being distributed throughout Boston the incidence of jaundice was rather alarmingly high in practically all the institutions in the city. Then the cases disappeared without our knowing why, although the same drug was being used right along but by a modified method.

DR. JONES: This came in December which is just about the time you get the seasonal increase of infectious jaundice.

CASE 21172

PRESENTATION OF CASE

A forty-seven year old American widow was referred to the House from the Out Patient Department because of jaundice.

Eight months before entry the patient was first seen in the Ear Clinic because of deafness of a year's duration. Both Hinton and Wassermann tests were strongly positive. She was transferred to the Skin Clinic where an examination showed equal and regular pupils which reacted sluggishly. Examination of the heart was negative. The blood pressure was 165/95. A lumbar puncture gave clear colorless fluid. The total protein was 50 milligrams. The alcohol and ammonium sulphate tests were positive. The goldsol was 5555533211. The Wassermann test was strongly positive. A cell count showed 15 red blood cells. The dynamics were normal. A definite diagnosis of central nervous system syphilis was made. During the next month she received six injections of bismuth. Five months before entry she was started on tryparsamid treatment and during the next four months received fifteen injections. Approximately two months before entry she complained of pain running down the neck and shoulders to the hands. This pain was severe on the right side and only slight on the left, and disappeared almost completely within a week. One month before entry, when appearing for her sixteenth dose of tryparsamid, slight jaundice was noted. The treatment for that day was omitted and she was put on a high carbohydrate diet. In the course of a few days her skin became markedly jaundiced, her stools light colored and her urine dark brown. Her jaundice progressed and two weeks before entry she first noticed abdominal distention. Solid food at this time produced abdominal pain. An outside physician gave her some intravenous injections, sodium phosphate by mouth and advised enemas. Following this the distention improved, but approximately six days before entry it reappeared. She remained in bed for the next five days during which period black and blue spots appeared in her skin. She also noted bleeding from her gums and rectum.

She was married twenty-three years before admission. Her husband had deserted her several years before entry. Two children were living and well. There was no history of miscarriages.

Her past history is non-contributory except for ear trouble as a child for which she was treated several times. She had no further trouble until the onset of her present illness. There was no history of venereal disease.

Physical examination showed a well-developed and undernourished woman in no acute distress.

The skin and sclerae were intensely jaundiced. There were purpuric areas on both forearms and on the left leg. There was blood on the gums. Expansion of the chest was diminished. The lungs were clear. The diaphragms were elevated. The heart was displaced upward and to the left. The rate was slow and regular. No murmurs were heard. The blood pressure was 125/60. The abdomen was markedly distended and shifting dullness was easily elicited. The liver was felt only by ballottement about four fingerbreadths below the costal margin. Another observer was unable to make it out. The upper border of dullness was in the fifth rib. The spleen was not felt. The ankle jerks were not obtained; the left knee jerk was feeble, the right was not obtained.

The temperature was 97.8°, the pulse 45. The respirations were 18.

The urine was brown in color and had a specific gravity of 1.022 to 1.030, a slight trace of albumin and a positive test for bile. The sediment was negative. No leucin or tyrosin crystals were observed. The red blood cell count was 4,200,000, with a hemoglobin of 70 per cent, the white cell count 2,900, 80 per cent polymorphonuclears. The stools were light brown in color and were negative for blood. Both Hinton and Wassermann tests were positive. The van den Bergh was 22.5 milligrams per 100 cubic centimeters, direct reaction. A liver function test showed 100 per cent retention. The bleeding time was seven minutes. She was put on potassium iodide, 15 grains three times a day, and given intravenous glucose.

Two days after admission an abdominal paracentesis yielded three liters of clear, bile stained, watery fluid with a specific gravity of 1.002. A culture was negative. No cells were seen in the smear. After the abdominal tap the liver could not be felt. The liver dullness was small. She was transfused twice but on the sixth day began to vomit small amounts of blood. Another tap three days later yielded four more liters of similar fluid. The blood pressure fell to 60/40. She very rapidly failed and died that day.

Differential Diagnosis

Dr. Chester M. Jones: I presume that the Hinton and Wassermann tests were taken on the suspicion that the deafness might have been on a luetic basis.

Nothing is said about the knee jerks, nothing about the abdomen. I would like to know whether the liver and spleen were palpable, but it is not possible to make any assumption as to what the abdominal findings were.

The lumbar puncture would make one consider that the reflexes were not entirely normal. I assume they made a flat diagnosis of central nervous syphilis, tabes or taboparesis.

"Approximately two months before entry she complained of pain running down the neck and shoulders to the hands." I do not quite understand that. Though it is possible that it might be the shooting pains of tabes, the description does not quite fit. It might have been neuritis although that would certainly be unusual. It is rare indeed that one gets a neuritis from the use of tryparsamid. I should put down a question mark as to the cause.

"In the course of a few days her skin became markedly jaundiced, her stools light colored and her urine dark brown." She has definite biliary disease and from the findings alone one can say there is a block and it may be due to an intrahepatic or extrahepatic block as the case may be.

Two weeks after the onset of jaundice she became conscious of the fact that her abdomen was larger. There is no mention of constipation. I think it is perfectly proper to assume it is due to ascites rather than to a distended bowel.

"Solid food at this time produced abdominal pain." I cannot explain that statement. I suppose the most likely explanation is an acute gastritis or a subacute gastritis and that there is pain on the intake of food.

The use of intravenous injections may or may not give us any clue as to what she received. I presume that the physician felt she had severe liver disease. He must have known she was having antiluetic treatment and he may have given her sodium thiosulphate which is one of the methods of treating arsphenamine reactions or other drug reactions to heavy metals. It probably is of no value but it is used not uncommonly. It may have been intravenous glucose which would have been very much more to the point if she had what seems to be a definite toxic disturbance in the liver. The use of sodium phosphate is a time honored one in the presence of jaundice. It has no particular value over other mild cathartics so far as I know.

An enema was given in the hope that the abdomen was distended from gas rather than ascites. Following this the distention improved and it may well be that part of the distention was due to distention of large bowel with air.

She has become rather acutely sick in one month's time following the onset of jaundice. Jaundice came on without any symptoms to speak of. It was noticed by a physician rather than that she went to the physician speaking of it. That I think is not uncommonly so in patients with toxic jaundice due to one or another type of medication. They are usually not so sick subjectively as patients with acute jaundice due to catarrhal or infectious jaundice. During the month she became worse in spite of fairly

active treatment including intravenous therapy. Her abdomen became larger and finally, five days before the month was up, she developed purpura. If that is linked up with hepatic disturbance it is a fairly bad prognostic sign.

The past history is unimportant.

"The upper border of dullness was at the fifth rib." That upper border of dullness might have been ascites. It is difficult with an abdomen full of ascites to be sure what the upper border of dullness is due to.

One would not expect to feel the spleen except by ballottement. The pulse was very slow, a true bradycardia. This is a symptom often written about but very rarely seen in hepatic disorders. It is rather interesting to notice that one observer felt the liver and the other did not. It may be a fact that at one time the liver was up toward the anterior abdominal wall and could be ballotted and at another time could not be. Dr. Mallory has shown us on several occasions how difficult it is to attempt to determine the size of the liver. Both surgeons and medical men have the same difficulty and even at operation mistakes are made on the size of the liver. The fact that it was felt by one man does not mean that it was large. It may be a very small liver well anterior in an abdomen full of ascitic fluid.

The laboratory examination shows that she had a large amount of bile in the urine. The specific gravity was high, indicating dehydration. The albuminuria is of no significance except that it indicates a certain amount of irritation from the deep jaundice.

The red cell count was nearly normal but in view of the dehydration the true red count should be lower than this figure. The white cell count was remarkably low, 2,900, with a rather unusual picture of 80 per cent polymorphonuclears. With a count that low, 2,900, it is sometimes difficult to find one hundred cells and I am wondering if this is the absolute differential count. It may have been made on fifty or forty cells and the percentage taken. There is, no doubt, a leukopenia, which is not uncommon in severe liver disease, regardless of the type. At times one gets a leucocytosis with acute yellow atrophy but just as frequently we have a low white count. It is true that we get a low white count in infectious jaundice.

If there was a positive test for bile—and probably the actual test of a brown stool is as good as any test we have—it fits in with the diagnosis of acute yellow atrophy because one can have some bile going through and still have intense jaundice.

The Hinton and Wassermann tests were positive. That agrees with the previous tests.

The van den Bergh is definitely high with a direct reaction, which is of no significance at all from the point of view of diagnosis.

No mention is made of the clotting time. Presumably it would have been prolonged with poor clot retraction and a rapid sedimentation rate.

"She was put on potassium iodide, 15 grains three times a day, and given intravenous glucose." Apparently it was felt that she had a very sick liver and because of the possibility that in part it was associated with a syphilitic process they gave her iodides which could have done no harm. I doubt at this juncture whether they could have done any good either.

The specific gravity of the abdominal fluid is extremely low, a typical transudate with lower specific gravity than usual.

It is probable that the liver was not large at any time. If it was felt by the first man he caught it by ballottement because it was displaced by the ascitic fluid and was small rather than large.

As far as the diagnosis is concerned, it seems to me we can make no logical diagnosis except acute yellow atrophy. Whether she had a preceding disease of the liver in the nature of syphilitic cirrhosis or something else which had gone on for some time, no one can tell. There is no reason to suspect it. We have no help from previous examinations because there is no note as to what the abdomen was like when the treatment was started; but presumably she did not have cirrhosis previously.

The cause of the acute liver toxemia from which she died is a very difficult one to be dogmatic about. The two drugs used in this case were bismuth and tryparsamid. My own feeling is that it must be a very rare occurrence to have bismuth as the cause of acute hepatic damage. I suppose it is possible. It may occur because it is a heavy metal and is handled in part by the liver and we know that heavy metals do cause damage of the liver. We have had two or three due to antimony and we have had one or two cases apparently due to gold. We have had many that we thought were due to arsenic. Theoretically there is no reason why it might not be due to arsenic, but she did not have a large dose. Tryparsamid certainly is a rare cause. I think we have no cases in the hospital where that has been assigned as the cause. The trouble it usually brings about is an optic atrophy or a dermatitis, neither of which she had. All one can say here is that it was an arsenical, therefore it could in a particular instance cause acute liver damage. That it did is very difficult to say. I have forgotten the month in which this patient became ill.

DR. TRACY B. MALLORY: In March.

DR. JONES: Again the time when the infection that causes acute catarrhal jaundice is prevalent. In this past year there has been a great deal of acute infectious jaundice. It is possible that an infectious jaundice hit at the same time as the heavy metal and the combina-

tion of the two, with or without syphilis, might bring about a condition like this. The bleeding, the purpura and so forth are simply evidence of liver disease. I, personally, doubt if she could have been saved. We have without any question saved a certain number of cases of acute yellow atrophy from one or another cause in the last few years by glucose therapy and transfusion. I take it this woman had both. She was too sick by the time she came into the hospital for successful treatment. Purpura is not always a bad prognostic sign but it is apt to be. The fact that she had recurrence of ascites is indicative that the liver was hard hit. I should think the diagnosis was acute yellow atrophy, cause unknown. I do not believe syphilis of the liver will be found.

DR. E. LAWRENCE OLIVER: I agree with Dr. Jones that tryparsamid and bismuth very rarely cause any definite liver damage. That is about all I can say. It seems this is a case very much like the other, an acute yellow atrophy.

DR. A. W. CHEEVER: Tryparsamid seems to be a drug that is significantly free from accidents; even the eye damage is not common. I think I have seen four or five cases perhaps in a number of years with jaundice following its use, always very mild, except this one. Even dermatitis from tryparsamid is rare; I have never seen more than one case to be sure of it, although I have been suspicious of one.

With regard to bismuth causing liver damage, certainly I am sure we are not seeing any more now that bismuth is being used very freely than in the days when mercury was the only non-arsenical drug of value. I wanted to say one thing, more applicable to the previous case. I think patients in this age group should not be treated with arsphenamin without a great deal of thought since I believe it is rather likely to be distinctly dangerous, and unless there is some definite indication it should not be given. In this case there was a definite reason in the central nervous system involvement.

DR. W. D. SMITH: I have nothing to add but my prognosis on this case was at least correct. I felt that she had hepatitis. I doubt if the tryparsamid had anything to do with it. I should like to ask Dr. Jones if the blood pressure falling to 60 would suggest hemorrhage? I should also like to ask him if this type of person does die of hemorrhage the way a portal cirrhosis might die of hemorrhage.

DR. JONES: I did not know that they die of frank hemorrhage such as a hemorrhage from ruptured varix but I think they occasionally do have diffuse bleeding from the gastrointestinal tract, but not enough to drop the blood pressure in that way. I think that was because she was so ill and it was shock, partly from hemorrhage and partly from the fact that she was dying. I do not think she lost enough blood to drop the blood pressure that way.

CLINICAL DIAGNOSES

Toxic hepatitis with acute yellow atrophy of the liver.
Ascites.
Central nervous system lues.
Gastric hemorrhage.

DR. CHESTER M. JONES'S DIAGNOSES

Toxic hepatitis—acute atrophy of the liver.

ANATOMIC DIAGNOSES

Early toxic cirrhosis of the liver.
Ruptured esophageal varix, with hemorrhage.
Icterus.
Ascites.
Leiomyoma uteri.

PATHOLOGIC DISCUSSION

DR. MALLORY: The autopsy in this case showed a liver as small as that found in the preceding case, but whereas the first liver was soft and flabby, obviously freshly necrotic, this liver was firm, tough and definitely cirrhotic. The nodules that projected from the surface varied all the way from three millimeters up to two centimeters in diameter; a degree of marked variability in size which one does not see in the alcoholic type of cirrhosis but characteristically does see in the type of cirrhosis that follows an acute yellow atrophy.

Microscopically it is evident that though there is definite cirrhosis the process is a fairly recent one. There is no actual necrosis of liver cells going on. The liver cells which are left are found in islands of irregular size, and individually they tend to be quite large, sometimes multinucleated, occasionally in mitosis. Between them are found bands of rather loose, very vascular connective tissue with innumerable proliferating bile ducts. There are large areas where groups of bile ducts, evidently once supplying many lobules, have shrunken together in the midst of small foci of scar tissue. I think we can quite flatly say this is the type of cirrhosis that develops on the basis of atrophy. It is not so easy to be dogmatic, however, as to how long it has lasted. My guess would be that it is quite a recent process, probably under four months and over two months, though it must be admitted that any such estimate is little more than guesswork. Her actual story from the time she noticed jaundice to death was of six weeks' duration, so I am forced to assume that the onset of her disease occurred at least a couple of weeks before she first noticed jaundice. The immediate cause of death, as Dr. Smith suggested, was hemorrhage. The stomach and most of the upper intestinal tract were filled with liters of blood and a ruptured esophageal varix was easily located just at the base of the esophagus above the cardia.

DR. JONES: It would seem that she had been

getting enough damage from a toxic substance to have gone through a course of subacute yellow atrophy probably without jaundice for some time before she actually developed the full clinical picture.

OMISSION

In Case 21142, published April 4, 1935, the Presentation of the Case is incomplete. The remainder of the history is as follows:

The temperature was 101.2°, the pulse 100. The respirations were 20.

Examination of the urine showed a specific gravity of 1.012 to 1.018 with a trace of albumin. The sediment showed 2 to 3 white blood cells, 4 to 5 red blood cells and a rare granular cast. The red blood cell count was 3,220,000, with a hemoglobin of 70 per cent. The white cell count was 12,500, 72 per cent polymorphonuclears. An electrocardiogram was normal. A Hinton test was positive. A phenolsulphonephthalein test showed 30 per cent excretion in ninety minutes, only 5 per cent of which was excreted in the first 15 minutes. The nonprotein nitrogen was 60 milligrams.

X-ray examination of the chest showed high diaphragms, prominent hilus shadows and haziness in the right lower lung field. The heart was triangular in shape with a straight left border and some prominence in the region of the pulmonary conus.

He was given digitalis, six grains a day for two weeks and then only one and a half grains a day for a week. He was discharged improved three weeks after admission.

Third Admission, three months later.

After being at home for five days he had a chill followed by a painful right knee. He rested for about two weeks, with complete relief. He continued to have edema of his ankles in the late afternoon and also shortness of breath. The red spots had remained on his legs for the past three months. There was no bleeding from the gums or nose. He had nocturia once a night but there had been no pyuria, dysuria or hematuria. For ten weeks he had had pain in his legs on walking which was relieved by rest. There were no disturbances of vision or headaches. On the day of entry he developed more shortness of breath and became lethargic. During this period he had been working as an elevator operator eight hours a day and had been taking digitalis, one and a half grains daily.

Physical examination showed a dyspneic and orthopneic man with a few small petechiae on both forearms, more on the right than the left. The legs from the groin down were covered with numerous petechiae and there was considerable redness of the intervening skin. The heart was enlarged to the left. The sounds were rapid and forceful. The first sound was loud. A systolic and a long diastolic murmur were heard at the apex. The blood pressure was 146/70. The liver was felt three fingerbreadths below the costal margin, and the spleen was just palpable. There was pitting edema of both legs. The fingers were slightly clubbed.

The temperature was 98°, the pulse 112. The respirations 30.

Examination of the urine showed a specific gravity of 1.020 and a trace of albumin. The sediment showed 20 to 40 red blood cells and 5 to 6 white blood cells. The red blood cell count was 2,600,000, with a hemoglobin of 60 per cent. The white cell count was 9,000, 74 per cent polymorphonuclears. The nonprotein nitrogen was 97 per cent. An electrocardiogram was normal. The phenolsulphonephthalein test showed 25 per cent excretion in one hour, 5 per cent being excreted in the first fifteen minutes. Six blood cultures yielded no growth.

One week after admission he suddenly had a convulsion from which he could not be aroused for about fifteen minutes. His blood pressure was 160/90. He soon began to breathe more easily. No paralysis was noted. One hour later he complained of precordial pain and headache. Two days later his neck became stiff and Kernig could be obtained on both sides. A lumbar puncture was negative. His nonprotein nitrogen rose to 142. He rapidly failed and died on the twelfth day.

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The Massachusetts Medical Society

ANNUAL MEETING

THE SCIENTIFIC EXHIBITS

To the discerning visitor at the annual meeting of the Society, one of the most interesting institutions is the scientific exhibit, or rather, collection of exhibits. Through their wide diversity of subjects they offer something that is new to even the most erudite observer. Of no class of men can it more truly be said than of physicians that, "Knowledge is their stock-in-trade," and the knowledge offered by these exhibits is of the most useful kind, since it comes at first hand from the men best qualified to impart it.

This year at the Statler the scientific exhibits will be not only better, but better shown than in the past. No longer can they be relegated to some obscure bedroom on a back corridor, advertised by an amateurish arrow on a limp cardboard sign. This year instead they will occupy the places of honor which by their importance they deserve.

Their diversity of subject is illustrated by only a few examples. Side by side with the surgery of thyroid disease, lung tumors, and cancer of the rectum will be exhibits dealing with lobar pneumonia, biological products, surgical treatment of pulmonary tuberculosis, and water and sewage purification. Nearby will be an exhibit of the problems and devices encountered in the treatment of fractures. Such dissimilar subjects as arteriosclerosis, industrial dermatitis, and the treatment of burns by anilin dyes will be exhibited within a few steps of the latest and most complete apparatus used in anesthesia. For the practical-minded there will be a demonstration of how the inside of the diseased stomach looks through the lens of a gastroscope, while those of a more imaginative nature will feel at home in an exhibit on sex hormonology and endocrinology. The sensation-seekers will be furnished with an extraordinary collection of pathological curiosities, and everyone will be impressed and fascinated by the triumphs of plastic surgery as recorded by photographs, drawings, and casts.

A feature of this year's meeting which will long be remembered is the very extensive exhibit, occupying two whole rooms and dealing with the various aspects of arthritis. This is a subject of great interest to medical men and of vital importance to the victims of this disease. Unfortunately, the solution of the problems involved is still in abeyance to a large degree but certain leads are being followed which may bring definite progress in knowledge relating to the etiology and treatment of the various manifestations of arthritis.

None of us can afford to miss the opportunity that will be provided by this most unusual exhibit.

A NEW FORM OF TREATMENT OF MENINGOCOCCIC MENINGITIS

FLEXNER'S investigations in 1907-1908 demonstrated the value of an antimeningitis serum in the treatment of this serious disease. Prior to his work the death rate had been between 75 and 90 per cent and in some epidemics almost 100 per cent. Flexner's serum reduced this figure to approximately 50 per cent, where it has stood for about twenty years, being only slightly lowered as we have learned more about the causes of death. Although we now can use serum in a variety of ways, such as into the cistern and into the ventricles, unthought of at the time when Flexner developed his serum, and we have been able to classify the various types of organism, thus developing either a specific serum for a certain type or a polyvalent serum which will combat many types of the disease, still in a large

series of cases a 40 per cent mortality is considered good. For many years it has been anticipated that an antitoxin would be developed, thus overcoming one of the fatal elements in the disease. In the last few years such an antitoxin has been produced and recently Dr. N. S. Ferry[1] and his coworkers of Detroit have succeeded in working out the bacteriological aspects of this problem satisfactorily.

The new antitoxin has been used clinically at the Cook County Hospital, Chicago. Dr. A. L. Hoyne[2] is now able to report on its use in 85 of 296 cases taken for observation. By the use of this meningococcus antitoxin the death rate has been reduced approximately 50 per cent. Thus we have added to the drugs available in treating this often fatal disease what appears to be a new and important form of therapy.

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2. Hoyne, Archibald L.: Meningococcic meningitis. A new form of therapy. J. A. M. A. 104: 980 (March 23) 1935.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

SMITH, GEORGE GILBERT. A.B., M.D. Harvard University Medical School 1908. F.A.C.S. Urologist, Massachusetts General Hospital, Palmer Memorial Hospital, and Collis P. Huntington Memorial Hospital. His subject is "Renal Infections." Page 751. Address: 6 Commonwealth Avenue, Boston, Massachusetts.

GATES, OLIVE. A.B., M.D. Yale University School of Medicine 1929. Assistant Pathologist, Collis P. Huntington Memorial Hospital. Address: 695 Huntington Avenue, Boston, Massachusetts. Associated with her is

WARREN, SHIELDS. A.B., M.D. Harvard University Medical School 1923. Pathologist, New England Deaconess, Huntington Memorial, Pondville State, New England Baptist and Robert B. Brigham Hospitals. Consulting Pathologist, House of the Good Samaritan. Director, State Tumor Diagnosis Service. Instructor in Pathology, Harvard Medical School. Address: 195 Pilgrim Road, Boston, Massachusetts. Their subject is "The Transplantation of Uninjured Tumor Cells." Page 759.

BUTLER, ALLAN M. Lit.B., M.D. Harvard University Medical School 1926. Faculty Instructor, Pediatrics, Harvard Medical School. Associate Physician, Children's and Infants' Hospitals, Boston. His subject is "The Dietary Management of Diabetics at the Diabetic Clinic of the Infants' and Children's Hospitals, Boston, Massachusetts." Page 760. Address: Children's Hospital, 300 Longwood Avenue, Boston, Massachusetts.

EMERY, E. S., JR. See This Week's Issue, page 694, issue of April 11, for record of author. His subject is "Progress in Gastro-Enterology for 1934." Page 764.

CRAIG, WINCHELL MCK. A.B., M.S., M.D. Johns Hopkins University School of Medicine 1919. F.A.C.S. Associate Professor of Surgery, Mayo Foundation, University of Minnesota Medical School. Neurological Surgeon, Mayo Clinic, Colonial and St. Mary's Hospitals. His subject is "Physiology, Pathology, and Treatment of Craniocerebral Injuries." Page 777. Address: Mayo Clinic, Rochester, Minnesota.

The Massachusetts Medical Society

SECTION OF OBSTETRICS AND GYNECOLOGY*

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DISCUSS FIBROIDS COMPLICATING PREGNANCY

ALTHOUGH patients with fibromyomata of the uterus frequently go through pregnancy, labor and the puerperium uneventfully, the combination may cause troublesome and serious abnormalities.

Elderly primiparae and multiparae with a long interval between pregnancies are more prone to have fibroids. The uterus busy with reproduction rarely develops this type of tumor. Conversely, conception is often prevented by the growth and it is estimated that 30 per cent of women with fibroids are sterile. Myomectomy may restore fertility in some of these.

If pregnancy does occur, about 25 per cent result in abortion or premature labor. This allies fibromyomata with syphilis, the toxemias and abnormalities of the cervix in interrupting pregnancy.

As this may be the patient's only pregnancy, it should be safeguarded in every possible way by rest and the avoidance of operative interference unless absolutely indicated. The most frequent complication during pregnancy is necrobiosis or red degeneration. The growing uterus interferes with the blood supply to the tumor, so that central necrosis occurs. This causes pain, often intense, over the site of the fibroid. There is usually a rise of one or two degrees of temperature and a slight leucocytosis. There may be flowing per vaginam. With rest and sedatives these symptoms frequently subside, permitting the pregnancy to progress to term.

*A series of short selected articles by members of the Section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the Section.

If, however, conservative measures are not effective, the tumor must be removed. Myomectomy may cause miscarriage, but as a rule it does not; on the contrary, in some of the writer's cases it undoubtedly *prevented* an interruption of the pregnancy. If these patients are otherwise normal, they may be delivered through the pelvis at term, as myomectomy, per se, unless very extensive, is not an indication for cesarean.

Rarely a large tumor will necessitate hysterectomy before viability, but usually even patients with large tumors can be carried to the eighth month or later so that a living child may be obtained. During labor, tumors of the fundus usually do no harm. They may interfere with uterine contraction.

In the lower uterine segment even small fibroids may cause dystocia by interfering with retraction. On the other hand some tumors are rendered innocuous by being drawn out of the pelvis during the first stage of labor. Rarely a subserous fibroid may be pushed up to permit pelvic delivery. However, if the neoplasm blocks the birth canal, the best interests of mother and baby are served by a cesarean myomectomy or hysterectomy before, or early in, labor.

At cesarean, fibroids, of any considerable size, should be removed. If they remain, degeneration, sepsis from interference with drainage, or subinvolution may occur. If the patient escapes these the growth may cause complications in future pregnancies, or necessitate another operation.

THE TREASURER'S REPORT

Covering Refund Distribution

The treasurer of the Massachusetts Medical Society makes the following report regarding the refund to District Societies for 1935.

The Council voted to distribute the sum of $5000 to District Societies. The total number of payments of annual dues received by the treasurer, for March 1st and to be counted for the refund, was 3279. Therefore the refund to the District Societies for each paid Fellow is $1.5248.

The following table gives the number of payments in, and the refund to, each District:

District	Number Reported Paid	Check
Barnstable	36	$54.90
Berkshire	78	118.95
Bristol North	53	80.83
Bristol South	146	222.63
Essex North	138	210.43
Essex South	168	256.18
Franklin	35	53.38
Hampden	198	301.93
Hampshire	41	62.53
Middlesex East	77	117.42
Middlesex North	101	154.02
Middlesex South	603	919.47
Norfolk	554	844.73
Norfolk South	70	106.75
Plymouth	94	143.35
Suffolk	518	789.84
Worcester	307	468.11
Worcester North	62	94.55
	3279	$5000.00

In 1934, for comparison, the total number of payments for the refund was 3229.

Charles S. Butler, M.D.,
Treasurer.

April 18, 1935.

SECOND ANNUAL POSTGRADUATE MEDICAL EXTENSION COURSE

The following sessions have been arranged by the Committee for the week beginning April 28:

Berkshire

Thursday, May 2, at 4:30 P.M., at the St. Luke's Hospital, Pittsfield. Subject: Dermatology and Syphilis. Albert C. England, M.D., George S. Reynolds, M.D., Chairmen.

Bristol South (New Bedford Section)

Friday, May 3, at 4:00 P.M., at the St. Luke's Hospital, New Bedford. Subject: Cardiovascular Disease (Third Session). Harold E. Perry, M.D., Chairman.

Franklin

Wednesday, May 1, at 8:00 P.M., at the Franklin County Public Hospital, Greenfield. Subject: Cardiovascular Disease (Third Session). Halbert G. Stetson, M.D., Chairman.

Hampshire

Wednesday, May 1, at 4:15 P.M., in the Nurses' Home of the Cooley Dickinson Hospital, Northampton. Subject: Surgery (Third Session). Robert B. Brigham, M.D., Chairman.

Norfolk (Norwood Section)

Friday, May 3, at 8:30 P.M., at the Norwood Hospital, Norwood. Subject: Obstetrics and Gynecology (Third Session). Hugo B. C. Riemer, M.D., Chairman.

Worcester (Milford Section)

Thursday, May 2, at 8:00 P.M., at the Milford Hospital, Milford. Subject: Obstetrics and Gynecology (Second Session). Joseph I. Ashkins, M.D., Sub-Chairman.

Worcester (Worcester Section)

Wednesday, May 1, at 7:30 P.M., in the Nurses' Home of the Worcester City Hospital, Worcester. Subject: Cardiovascular Disease (Second Session). Erwin C. Miller, M.D., Chairman.

Worcester North (Fitchburg Section)

Friday, May 3, at 4:30 P.M., at the Burbank Hospital, Fitchburg. Subject: Cardiovascular Disease (Third Session). Edward A. Adams, M.D., Chairman.

AN APPEAL TO THE DISTRICT MEDICAL SOCIETIES OF THE MASSACHUSETTS MEDICAL SOCIETY

The Massachusetts Medical Society has commanded the Public Relations Committee to institute a campaign of public education in the matter of the evils of Compulsory Sickness Insurance. This is in support of the American Medical Association and in accord with similar activities engaged in by many other state societies.

The Public Relations Committee cannot carry out this most important work without the help and active coöperation of all the districts. The Committee urges the immediate formation and organization of the District Public Relations Committees, so that it may contact these groups and coöperate with them in the part which they will be called upon to play. The labors of the Committee will be much lightened and the progress of the work much advanced if the districts will form these public relations groups immediately and send their names to Dr. M. A. Tighe, 9 Central Street, Lowell, Mass., Chairman of the Sub-Committee on Social Legislation and Insurance.

Dr. William H. Robey, President of the Massachusetts Medical Society, has already addressed the District Societies on this matter.

M. A. TIGHE, M.D.,
Chairman of the Sub-Committee.

MISCELLANY

NEW MOLD MAKES SARCOLACTIC ACID

Another mold has been harnessed and put to work by chemists in the U. S. Department of Agriculture. This one is a species of Rhizopus and a relative of the common bread mold. When properly fed and cared for this Rhizopus produces sarcolactic acid, a component part of ordinary lactic acid, the acid found in sour milk. Work which led to the discovery of this mold was described recently before the American Chemical Society in New York, in a paper by G. E. Ward, L. B. Lockwood, O. E. May, and H. T. Herrick, of the Bureau of Chemistry and Soils.

Sarcolactic acid derives its name from the fact that it was originally prepared in 1808 from animal flesh, which is still one of the principal sources. It is found in small quantities in the human body, and plays an important part in human metabolism—the process by which the body converts food into fuel and energy. Because of limited sources heretofore available sarcolactic acid has been very hard to get in quantity in pure form, and difficulties encountered in its preparation have held the price near a dollar a gram. With the new molds at work indications are that this price can be materially cut, thus making pure sarcolactic acid generally obtainable for physiological and industrial investigations.

Heretofore the only lactic acid produced industrially has been the inactive form, which is manufactured by the bacterial fermentation of starch. The sarcolactic acid which has been made in the laboratory up to the present time has usually contained impurities. The new process now being developed in the Department gives relatively high yields of a pure product.

Discovery of the mold that makes sarcolactic acid is an outgrowth of a study, begun in 1926, of the application of molds to the utilization of farm products. Other molds have been found for making gluconic and kojic acids.—*U. S. Department of Agriculture.*

NEW ENGLAND HEALTH OFFICERS' MONTHLY STATEMENT OF VENEREAL DISEASES REPORTED FOR FEBRUARY, 1935

This statement is issued monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The following reports were received from State Health Officers. The figures are preliminary and subject to correction. It is hoped that this will stimulate more complete reporting of these diseases.

State	Syphilis		Gonorrhea	
	Cases Reported During Month	Monthly Case Rate per 10,000 Population	Cases Reported During Month	Monthly Case Rates per 10,000 Population
Connecticut	192	1.17	117	.71
Maine	42	.52	35	.44
Massachusetts	379	.88	360	.83
New Hampshire	5	.11	20	.43
Rhode Island	64	.91	58	.83
Vermont	21	.58	19	.53

—Treasury Department, Public Health Service.

PREPAID HOSPITALIZATION

The Weymouth (Mass.) Hospital has arranged to provide service for three weeks on payment of fifteen dollars per year per person of such as may be accepted by the hospital trustees. This is only about four cents a day.

Seventy-four institutions in New York have arranged for group hospital care of wage-earners in the low income brackets at the rate of three cents a day. It is predicted in the announcement that, within a few years, more than one million contributors will take advantage of this plan with more than one hundred hospitals coöperating.

THE APPOINTMENT OF FREDERICK F. RUSSELL

Frederick F. Russell, the general director of the International Health Board of the Rockefeller Foundation from 1923, will be lecturer on preventive medicine and hygiene and epidemiology at the Harvard Medical School for one year, beginning next September, according to the *Boston Herald.*

AWARD OF FELLOWSHIPS AND SCHOLARSHIPS

The award of nineteen fellowships and scholarships for the academic year 1935-1936 to students in the Harvard Medical School has been announced.

The total monetary consideration for these awards is $16,475.

Ten residents of Boston are recipients of ten of these awards. This shows how the Harvard Medical School stands in relation to deserving students who may profit by financial assistance.

CORRESPONDENCE

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION

COUNCIL ON PHARMACY AND CHEMISTRY

Editor, *New England Journal of Medicine,*

In addition to the articles mentioned in our letter of February 28 the following have been accepted:

The Calco Chemical Co.
Aminoacetic Acid
The Cutter Laboratory
Diphtheria Toxoid Alum Precipitated, Refined
Lederle Laboratories, Inc.
Scarlet Fever Streptococcus Immunizing Toxin
Scarlet Fever Streptococcus Toxin for the Dick Test
Eli Lilly & Co.
Metycaine Tablets, ½ grain
Ophthalmic Ointment Metycaine, 4 per cent
Parke, Davis & Co.
Capsules Ortal Sodium, 5 grains (0.3 Gm.)
Meningococcus Antitoxin
E. R. Squibb & Sons
Ipral-Amidopyrine Tablets, 4.33 grains
Ipral Sodium
Ipral Sodium Tablets, 4 grains

Yours sincerely,
PAUL NICHOLAS LEECH, *Secretary*
Council on Pharmacy and Chemistry.

MEDICAL ORTHOEPY

April 5, 1935.

Editor, *New England Journal of Medicine,*

To-day public speaking is becoming almost as important to the physician as to the lawyer. Among the medical words too commonly incorrectly pronounced by many of us are the following:

Cerebrum and cerebral with the accent on the first syllable.

Cocci with the third c soft.

Digitalis with a long a.

Fibrillation with the first i long.

Phthalein with the first consonant digraph, ph, preferably silent and the last two vowels pronounced separately.

Phthisis as if spelled thisis.

Phthisic and phthisical as if tiz-ic and tiz-i-cal, respectively.

Rabies with the a long and three distinct syllables.

Rabid with its a short.

Urea and urease with the stress on first syllable.

Ureter with it on the second.

Urethane with the accent on the second, u-reth'-ane.

Vertebra and vertebral, like the first two words in this list, accented upon the first syllable.

Some of the older men fail to use the preferred pronunciation of abdomen with the accent on the penult and paresis with its accent on the ante-penult. Others forget that the first i in the suffix itis is always long in such words as bronchitis as well as appendicitis.

Yours truly,
G. W. HAIGH, M.D.

242 Burncoat Street,
Worcester, Mass.

EDITORIAL NOTE: The pronunciation of medical terms does not always agree in the several medical dictionaries. The American Illustrated Medical Dictionary (Dorland) in some instances is authority for other pronunciations than those cited above.

COOPERATION OF MEDICAL AND PSYCHOLOGICAL PROFESSIONS

WARREN STATE HOSPITAL
WARREN, PA.

April 4, 1935.

Editor, *The New England Journal of Medicine,*

After reading your editorial in the issue of March 28 entitled "Psychologism and Medicine" I cannot refrain from letting you know that I, for one, think that your attitude toward the profession of psychology is somewhat biased and your attack unwarranted. I challenge you to find a reputable psychologist who will not agree that a person untrained in medicine is unqualified to "determine the physical condition of the sufferer". Let me assure you that no psychologist who hopes to gain the respect of his own profession will take upon himself work which belongs within the field of medicine or any other specialty in which he does not happen to be qualified. Only a very small percentage of the eighteen hundred members of the American Psychological Association are professionally interested in healing or psychotherapy. Most of these are working either with or under the direction of psychiatrists, and you will find that they are well oriented in their professional relationships.

The principal reason for the present correspondence is that it is my firm conviction that both the medical and psychological professions could benefit from a little better mutual understanding and coöperation. You assume that we are unversed in the biological aspects of man. We readily admit this, but we do not underestimate their importance and we respect you for your knowledge. To the psychologist, however, the medical practitioner is notoriously unversed

in the human individual as anything *but* a biological being. As long as you continue to think of a large and respected scientific organization as made up of "mere psychologists" you will no doubt continue to think of man as made up of "the body and the psyche". You will fail to learn that the "so-called professional psychologists" gave up this viewpoint years ago in favor of the conception of man as an organism, *both* biological and psychological, functioning, developing, and behaving, in response to, and in interaction with, the environment in which he finds himself.

Yours very truly,

HARRY C. MAHAN, *Staff Psychologist.*

RECENT DEATHS

GOODALL — HARRY WINFRED GOODALL, M.D., of 1 Raleigh Street, with an office at 51 Bay State Road, Boston, died April 17, 1935, after an illness of several months. He was born at Wells, Maine, in 1876, the son of George B. and Isabel M. (Norton) Goodall.

His premedical education was acquired at Berwick (Maine) Academy and at Dartmouth College, taking his A.B. degree in 1898 with honors and was a member of Kappa Kappa Kappa. He graduated from the Harvard Medical School, summa cum laude, in 1902, and served an interneship at the Massachusetts General Hospital, and later at the Boston Lying-In Hospital. He was also assistant resident-physician at the Massachusetts General Hospital. He studied at the University of Tübingen, Germany, in 1908. He lectured on digestive diseases at the Dartmouth Medical School and was instructor in Chemistry at the Harvard Medical School for a time.

His hospital associations were with the Boston Dispensary, New England Baptist, Peter Bent Brigham, Phillips House, New England Deaconess, Palmer Memorial, Chelsea Memorial, Burbank Hospital, Fitchburg; Symmes Hospital, Arlington; Sturdy Hospital, Attleboro; Framingham Hospital, Home for Aged Couples, Roxbury, in several of which he acted as chief.

He began his military service as major in the Army Medical Corps in 1917. After serving at Camp Greene, N. C., and Camp Wheeler, Ga., he went overseas in August 1918. He was commissioned Lieutenant-Colonel, August 9, 1918. He served as commanding officer of the gas hospital at Toul, France, and chief of the medical service at a base hospital until the close of the war. He was cited for meritorious and distinguished service.

He was the author of several important contributions to medical publications.

He joined the Massachusetts Medical Society in 1904 and was a member of the Council. His other Society memberships include the American Medical Association and the American College of Physicians. He was a member of the Masonic Fraternity, the Military Order of the World War, the Harvard Club, and the Square and Compass Club.

Dr. Goodall is survived by two brothers, George E. of Wellesley and Frank R. of Exeter, N. H., and two step-children, Edward W. Pierce and Mrs. Pollie Pierce Thompson of Concord, N. H.

MARTIN—HAROLD WINTHROP MARTIN, M.D., of 60 Ridge Street, Milton, with an office at 106 Warren Street, Roxbury, died at his home, April 15, 1935. He was born in Boston in 1887, the son of John and Mary (Kohlman) Martin. He graduated in medicine from the Tufts College Medical School in 1912.

Early in life he was prominent in athletic fields. He maintained practice from 1914 until obliged to retire because of a long illness. He joined the Massachusetts Medical Society in 1913, and was also a Fellow of the American Medical Association. He was a member of the Washington Lodge and Mt. Vernon Royal Arch Chapter of the Masonic Fraternity, and the Quinnobequin Lodge of Odd Fellows.

Dr. Martin is survived by his widow, Mrs. Mildred Harlow (Cook) Martin; two children, Virginia Martin and Winthrop Martin; two brothers, Dr. Edward Martin of Roxbury and John Martin of Wingdale, New York, and a sister, Mrs. Marion Robinson of Somerville, Massachusetts.

CURLEY — GEORGE FREDERICK CURLEY, M.D., died suddenly from cerebral hemorrhage at his home, 10 Congress Street, Milford, Mass., April 15, 1935.

Dr. Curley was born in Upton, Mass., in 1872, and received his early education there. He was graduated from Massachusetts State College in 1892, and from Jefferson Medical College in 1896; he interned at Elizabeth General Hospital, Elizabeth, N. J., for a year and began practice in Milford in 1897.

He was appointed on the surgical staff of Milford Hospital when the hospital was opened in 1903 and served until his death faithfully and well. He was Medical Examiner of the Sixth Worcester District, and a member of Thurber Medical Association, Massachusetts Medical Society and American College of Surgeons.

He is survived by his daughter, Regina, wife of Dr. John W. Gahan of Medford; one grandson, John George Gahan, and three brothers, Dr. Alfred J. Curley, of Milford; William P., of Kearney, N. J., and Robert M., of Biddeford, Me.

NOTICE

BOSTON UNIVERSITY SCHOOL OF MEDICINE SURGICAL CLINIC AT THE BOSTON CITY HOSPITAL

Friday, May 10, 12-1, Cheever amphitheatre.

Dr. Tracy J. Putnam, Professor of Neurology at the Harvard Medical School, and Visiting Neurologist at the Boston City Hospital, will discuss "Head Injuries."

Physicians and medical students are invited.

REPORTS AND NOTICES OF MEETINGS

WILLIAM HARVEY SOCIETY

Dr. Percy S. Pelouze gave an amusing and instructive lecture on "Neisseriania" at a meeting of the William Harvey Society held on March 8 at the Beth Israel Hospital. Dr. Harold A. Chamberlin presided. Doctor Pelouze stressed the fact that more medical interest is needed in this important subject, and said that he would present his ideas which he has tried to put on a scientific basis. By a series of slides he showed the high prevalence of both gonorrhea and syphilis in hospitals, as compared with other communicable diseases. The fact that in some cities of the United States druggists treat well over twice as many cases of gonorrhea as do physicians is startling, and on a questionnaire sent out to the young men of these cities it was found that many more of them would seek advice from the druggist than from the doctor, for the treatment of this infection. These facts demonstrate the necessity of increased activity on the part of the physician with regard to the handling of this disease.

Gonorrhea is not a surface condition, and surface bactericides will not kill the organisms. The patient is cured only by building up an immunity within himself, and while physicians may stimulate this process, they may definitely hinder it. Slides were shown demonstrating that the gonococcus infiltrates deeply into the tissues, and that it has certain characteristics of penetration, in particular that it cannot go through squamous epithelium or columnar epithelium over which there is a cuticular layer. It does penetrate simple columnar epithelium as well as transitional epithelium, especially that type which tends to stretch easily. However, transitional epithelium usually sets up a fairly rapid immunologic process, and the response to the infection is good. Because of these characteristics of penetration we may look for the gonococcus in the male chiefly within the urethra and the glands communicating with this structure as well as the prostatic gland.

Infection of a free surface will recover if left alone, and glands which have free drainage will also heal, but glands the neck of which become infiltrated are apt to become partially occluded, so that the drainage is intermittent and the infection becomes chronic. If the gland becomes entirely closed off, lytic sterilization occurs and this process is what usually happens in salpingitis. Racemose glands such as Cowper's and Bartholin's glands usually become abscessed when infected because of poor drainage. In the cervix the glands are of the tubular type, and it is very difficult to clear up an infection here unless the entire gland area is destroyed. The prostate is made up of very intricate glandular structures, but gonorrheal infection here does clear up.

The individual develops immunity only to that specific type of gonococcus with which he is infected, and this immunity is definitely hindered either by sexual excitement, not necessarily intercourse, or by alcohol. It is to be remembered that the patient will get well of his own accord, but the doctor can be of definite assistance to him, and the speed with which he recovers under proper treatment will be directly proportional to the care with which he follows instructions. New proprietary treatments are often successful at first because of the special interest of the patient, and it is only after the novelty wears off that both physician and patient lose their interest, and at the same time the therapy loses its efficiency. Strong penetrating chemicals cause complications and mild treatment is definitely indicated. Doctor Pelouze believes that the reason that stricture is much less frequent than it used to be is that the treatment is less severe at present. Diet seems to have little importance in the treatment of gonorrhea.

In the male the course of this disease can be easily followed and a physician to treat the condition intelligently must understand the different courses that it may take. The amount of pus is a direct index to the amount of infection, but it must be remembered that the urine clears long before the gonococcus is gone, and that the disease has a steady trend toward latency. Doctor Pelouze charts urine trends as one would chart a temperature, and by knowing these trends he shows accurately the course of the disease. In an untreated anterior infection the first glass is cloudy and the second glass is clear until about the eleventh day at which time there is a long steady line of decline toward the normal which is reached by about the twenty-fifth day. Any sharp upshoot of the urine generally means some "mucosal insult", such as alcohol or sexual excitement. In the posterior urethral infection both glasses are cloudy at first and there is then a steady decline toward normal. By knowing these untreated courses the effectiveness of one's treatment is easily gauged. Several charts were shown demonstrating these facts and the results of both poor and good treatment were shown.

Invariably the use of vaccine causes a sudden rise in the urine chart, and there is good evidence that such therapy is of no value. After the first or second prostatic massage there is apt to be a reaction shown in the urine chart which does not show with further massaging. There are few complications if the patient behaves and the physician is gentle. It is very difficult to control dispensary patients, but office patients are usually easily regulated. The patient must be told the facts and what he can expect if he does not assist the doctor. The condition is one hundred per cent curable in the male, but in the females they infect, dire consequences may ensue. It is a crime that the public pays so little attention to this dangerous and prevalent disease, and it is hard to understand why national radio hookups prevent any mention of syphilis and gonorrhea, considering the sort of moving pictures that are released. Thirty per cent of

urethral discharges are not due to the gonococcus, and it is important that the physician examine the discharge microscopically.

It does not matter so much what is used in the treatment as how it is used. Oral urinary antiseptics and vaccines and gonococcus filtrates have been discarded by Doctor Pelouze for the most part, and we do not know how to produce immunity. Simple mild local applications are of definite benefit.

In the discussion that followed, Doctor Nelson said that he was very much pleased to think that the William Harvey Society was showing a real interest in gonorrhea. Doctor Riley stressed the importance of a microscopical examination of the discharge, the uselessness of sandalwood oil and vaccines. Medical schools do not spend enough time stressing gonorrhea. He feels that strictures are due to infections about the urethra in the glands rather than simply to strong antiseptics. Doctor Sawyer said that the physician must be willing to give his whole-hearted attention to the condition, or else send his patients to those who will. Doctor Chamberlin asked what was the usual percentage of posterior involvement in his patients.

Doctor Pelouze pointed out that he based his opinion on strictures in the pathological picture in that the polymorphonuclear cells which are seen in gonorrhea do not cause scar tissue, while irritating solutions stimulate the increase of mononuclear cells which do cause scar tissue. In a large group of patients taken without selection seventy-five per cent showed posterior involvement, but if we choose those patients seen by the fifth day of the disease only fifteen per cent show this extension. In those seen after the fifth day almost one hundred per cent have or will have posterior involvement. This shows the necessity of early mild treatment. The gonococcus complement fixation test as used in the diagnosis of gonorrheal arthritis is of definite evidence if the laboratory is skilled in the use of this test. Doctor Pelouze feels that a great deal of arthritis is said to be due to the gonococcus simply because there is a history of past infection, and it must be remembered that anybody with a chronic arthritis will have a definite recurrence, if there is a posterior urethral infection.

MEDICAL CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

Dr. Henry A. Christian presented a series of patients with pulmonary conditions at his Thursday afternoon clinic on the seventh of March. The first case was a forty-six year old Russian woman who entered with a story of six weeks' severe cough and pain in the left lower thorax posteriorly. The onset was sudden while the patient was eating soup, and she had the sensation of a bone going down "the wrong way". Following this episode there had been almost constant cough and some vomiting. A few days later there was pain in the left lower thorax posteriorly, particularly when she coughed. Gradually the cough became productive, and at the time of entry she was raising from one to two cups of greyish-green sputum a day which left a bad taste in her mouth. On entry she was flushed and slightly cyanotic. Posteriorly in the left lower thorax there was slight dullness and decreased breath sounds. The history in this case is typical of a foreign body in the bronchus, and, although such accidents usually occur on the right side, left-sided foreign bodies are not infrequent. The proper diagnostic procedure is bronchoscopy; x-ray examination is not necessary, with so clear a history and definite physical signs indicative of an obstructed bronchus, although it may be confirmatory if convenient.

In this case about two days after bronchoscopy which simply showed evidence of inflammation on coughing, she expelled a bit of bone. By x-ray there was a question of a shadow of a foreign body with surrounding consolidation. The pulmonary process in this condition is a combination of inflammation (bronchitis and pneumonia) with atelectasis. The physical signs are often more helpful than x-ray examination in such cases, but x-ray taken in both inspiration and expiration may be of distinct value, when the foreign body is not opaque to x-rays and atelectasis and pneumonia are not present, because the air is not so easily forced out in expiration on the involved side. When a peanut is the foreign body, much inflammation ensues. Doctor Christian stressed the importance of waiting a few days after bronchoscopy to see whether the foreign body may not be coughed up, and being sure whether the patient is telling the truth before we disbelieve the story. Many cases of pulmonary foreign body have been missed because doctors do not believe the patient's history. In cases of pulmonary dermoid cysts the patient is apt to cough up hair, and physicians are very reluctant to believe this story which in itself is diagnostic, particularly if the hair is of a blond color and differs from that of the patient.

The second case was a fifty-nine year old Chinaman who entered with a story of loss of weight and strength for seven months, having lost twenty-three pounds in three months, although he had regained some of this. At night he had drenching sweats, and on entry he was emaciated, had a palpable liver and spleen, and one side of the chest was entirely flat to percussion. His chart showed a zigzag temperature, ranging from normal to one hundred and one. There was generalized slight enlargement of the lymph nodes. The chest was tapped on two occasions, and less than a litre of fluid removed each time, and on the second occasion an artificial pneumothorax developed. Following this procedure x-ray showed adhesions at the apex and two pockets of fluid. The entire left lung and the apex of the right lung were apparently normal. The chest fluid had a specific gravity of 1.015, and twenty-eight hundred red cells and seven hundred and thirty white blood cells with a differential which the first time showed twenty polymorphonuclear cells and eighty lymphocytes, but the second time this proportion was reversed.

The diagnosis of this case is probably either tuberculous pleural effusion or neoplasm, possibly of the lymphoma group because of the temperature and enlarged liver and spleen, although many Chinese have chronically enlarged spleens from an old malaria. Biopsy of a lymph node showed only slight hyperplasia.

The third case was that of a sixty-six year old Negro who entered with progressive dyspnea. Three and a half years ago he had a questionable attack of pleurisy which has been repeated on several occasions. He has gradually grown weaker and was forced to give up his work three months ago. For two months he has had a cough and a blood-streaked sputum, and he noticed that the cough tended to be more severe if he lay on his left side. There were no abnormal physical signs except dullness and decreased sounds in the right chest and the left lung seemed hyperresonant. Fifteen hundred cubic centimeters of bloody fluid with a specific gravity of 1.010 was removed from the right chest. By x-ray after the chest tap the trachea was displaced to the left and a mass was visible on the right side. The probable diagnosis is bronchiogenic neoplasm or a tumor of the mediastinal nodes of the Hodgkin's group.

The fourth case was a man who had an acute upper respiratory infection in the spring of 1933 since which he has felt weak, and he has had dyspnea and cough on exertion for the past eight months. He complained of night sweats and a loss of twenty-five pounds, together with a slight hemoptysis on two occasions. At a tuberculosis sanatorium a questionable apical haziness was found and later he was sent to the Peter Bent Brigham for diagnosis. On entry there was hyperresonance and a few râles at the left base. The right lung below the seventh rib posteriorly was flat, and the breath sounds and tactile fremitus were diminished. The above history suggests a slowly developing pulmonary process and x-ray showed a small amount of fluid and a mass in the lower lobe on the thirty-first of December. On January 6 a fungating mass which suggested neoplasm was found on bronchoscopy. A biopsy suggested a lymphocytic type of neoplasm and the lesion was given x-ray therapy, which apparently caused it to diminish in size and density, although on the present admission it seemed to have gained in size.

Doctor Christian closed his clinic by discussing one of his private patients, a sixty-four year old woman who at the time he saw her had been ill for six weeks. She was easily upset emotionally and very apathetic and had a fever up to one hundred and one and a half degrees in the evening. Physical examination and laboratory tests were entirely negative and x-ray examination in mid-December showed a questionable increase in the hilar density. She entered the hospital the third of February with fever and an enlarged liver, as well as evidence of slight pleural fluid on both sides. This fluid was removed, clotted quickly, but showed no abnormal cells. At this time x-ray examination disclosed a distinct rounded hilar mass probably a primary bronchiogenic neoplasm and this was confirmed subsequently at autopsy. Doctor Christian pointed out that in this case at first the continuous fever was the only pathological finding, while the positive x-ray shadow did not show until some time later. Fever is often an outstanding characteristic in pulmonary tumors, as illustrated by these patients.

PLYMOUTH DISTRICT MEDICAL SOCIETY

A stated meeting was held at the Plymouth County Hospital, South Hanson, March 21, 1935. The subject of the program presented by the Staff of the Hospital was "The Surgical Treatment of Pulmonary Tuberculosis".

Dr. B. H. Pierce, Superintendent, briefly outlined the present policy, which was inaugurated about three years ago, of having the cases requiring surgical treatment operated upon at the hospital. He then introduced the speakers.

Dr. John McCarthy discussed artificial pneumothorax, describing its indications, technic of administration, complications and results. He stressed the fact that pneumothorax is in general more effective in early cases, as adhesions are less frequently encountered, the lung is more elastic and responds to pressure better than in the late cases. Adhesions, fibrosis and thickened pleura frequently render ineffective attempts to compress the lung in the late cases.

Dr. E. K. Jenkins was then introduced and reported a case of long-continued, profuse hemoptysis which was revived from an almost moribund state by the use of adrenalin. At a later date this patient had a phrenic avulsion which has apparently been a factor in the prevention of hemorrhage and resulted in considerable improvement.

Dr. Roy Littlehale presented a statistical study of the surgical work at the Plymouth County Hospital. At present approximately eighty per cent of the patients receive some form of surgical treatment, either pneumothorax, pneumolysis, phrenic nerve operations or thoracoplasty. Pneumothorax is the most common surgical treatment, one hundred and three patients having been treated by this method with twenty-nine arrested cases. In sixty-one of these patients, adhesions prevented satisfactory collapse. Of fifty patients having a phrenic exeresis or a temporary paralysis, thirty-six were definitely improved. In four cases unsatisfactory compression of the lung was due to adhesions which were severed by internal pneumolysis with resulting collapse of the lung. Six patients have been treated by thoracoplasty, the operation being done in two or more stages.

Dr. G. A. Moore discussed briefly the three more definitely surgical procedures employed in pulmonary tuberculosis, phrenic operations, pneumolysis and thoracoplasty. The indications, technic and results of the different operations were described, emphasizing the fact that at the Plymouth County Hospital, pneumothorax or phrenic operations were

the first procedures employed in practically all of the cases treated surgically. Internal pneumolysis was done only in cases in which definite bands were demonstrated by x-rays as the possible cause of persistent cavitation, unsatisfactory collapse and positive sputum after thorough trial of pneumothorax. The technic of the operation was then demonstrated upon the skeleton with an artificial lung and adhesions.

The indications for thoracoplasty at the Plymouth County Hospital were presented in some detail, as it has been felt that the men in general practice and especially sanatorium patients may have a rather unwarranted enthusiasm regarding the benefits from the operation except in selected cases. The statistics presented by Dr. Littlehale show that a conservative attitude with regard to thoracoplasty has been adopted at the hospital.

It was emphasized that the shortened convalescence in the surgical cases at the hospital had resulted in a general improvement in the mental state and enthusiasm in other patients. As a result it has been necessary frequently to deny operation to many patients who seek it.

Moving pictures, illustrating the technic of pneumothorax and thoracoplasty, were shown by Dr. Pierce. Lantern slides were exhibited depicting the lung pathology on admission and the results obtained by pneumothorax, phrenic operation, pneumolysis and thoracoplasty with a demonstration of the patient.

GEORGE A. MOORE, M.D., *Secretary.*

ADVENTURE IN TROPICAL MEDICINE

Dr. Richard P. Strong delivered a most interesting lecture at the Harvard Medical School on the fifteenth of March under the auspices of the Phillips Brooks Association. Doctor Strong has recently returned from a scientific expedition to Africa, and spoke on "Adventure in Tropical Medicine." He pointed out that work is at the bottom of every successful adventure in medicine and that chance in scientific investigation "seldom favors the man that is not prepared," as Pasteur once said. Haphazard adventure seldom leads to success. Expeditions must be planned carefully and intelligently, those in charge must have the proper training, and although imagination is a great asset, it must always be carefully controlled and is secondary to preparation and training.

Doctor Strong spoke briefly of some of the successful adventures that investigators have had with regard to the discovery of the way in which diseases are transmitted through insects, Sir Patrick Manson first showed that the Microfilaria bancrofti causing the disease known as filariasis together with its common complication, elephantiasis, is transmitted by the mosquito. Laveran, a French army surgeon, discovered the malarial parasite, while Ross working in India demonstrated that other species of mosquito transmit this disease also. Ross was a mathematician and a poet as well as a physician. Reed and his associates in Cuba first demonstrated the method of transmission of yellow fever by the use of human volunteers. Yellow fever and dengue fever are both transmitted by the same species of mosquito. General Gorgas led the public health work which rid the United States and the Panama Canal Zone of the most dangerous diseases transmitted by mosquitoes. Bubonic plague is caused by a bipolar staining organism which is transmitted by rat fleas from rats to man. This was especially urged by Ogata in 1897. A different form of the plague, the so-called pneumonic plague, destroyed one-fourth of the earth's population in the fourteenth century. Another epidemic of this same type of plague attacked Manchuria in 1910, and Doctor Strong was a member of the expedition sent to study this disease. In the bubonic type rats must be controlled, and there is usually no infection from man to man, but in the pneumonic type direct droplet infection occurs, and, therefore, its control rests especially on the early detection and isolation of the cases, the evacuation of infected areas, and the use of masks. In this disease the alveoli are filled with organisms and the cases are invariably fatal.

Nicolle in 1910 demonstrated that a certain species of louse transmits typhus fever as well as relapsing fever, and in 1916 the Rickettsia bodies were shown to be the etiological agent in typhus fever. Recent investigations on a modified form of this condition, so-called Brill's disease, which occurs in this country have suggested that the rat flea may transmit the agent. The transmission of trench fever by pediculus humanus was proved during the World War. It had the greatest morbidity of any disease in the British Army. Theobald Smith in 1893 demonstrated that the tick transmits Texas fever. This was the first discovery which showed that an arthropod could transmit a protozoal disease.

In Onchocerciasis, a disease transmitted by flies, there are subcutaneous fibroid nodules on the trunk or about the knees or elbows in the African form, while in the Guatemalan form these nodules usually occur about the head, and ocular complications are common. In Guatemala the disease was carefully studied by a commission sent down from Harvard. It occurs only on the Pacific or southern slopes of the western volcanic mountains at an altitude of between twenty-two hundred and forty-five hundred feet. The vegetation is tropical or subtropical and the topography irregular, and there are numerous ravines at the bottom of which flow swift streams where the flies that transmit this condition breed freely. The inhabitants are descendants of the Mayans, and coffee is the important industry. While working in the coffee fields the people are especially exposed to the bites of these flies. In some villages as high as sixty-six per cent of the population were infected, while five per cent of the wild flies were infected. The small tumors range from two millimeters to five centimeters in diameter and are often from one to six in number. They occur on men, women, and children and are fibromata made up particularly of bundles of wavy collagen

fibres. The adult parasites are in the middle of the tumor where the male and female individuals breed, and millions of microfilariae are poured into the lymph every day from these focuses. There are sometimes slight xeradermatous changes in the skin, as well as slight pigmentary alterations, and the microfilariae may be found in the subcutaneous tissues. In the eyes they cause particularly a pericorneal conjunctivitis, keratitis, and iritis. Occasionally there is an infiltration of the optic nerve which causes total blindness. Microscopically the organisms can be seen throughout the cornea, and there is an infiltration around the vessels of the structures of the eye.

In 1926 the black fly was shown to transmit the African form of this condition, and this was confirmed in Liberia by the Harvard Commission. In Guatemala the Harvard Commission showed that three species of flies may transmit the disease. These breed on the rocks and grasses in the swift streams. They become infected when they bite an individual sick with the disease. The organisms are taken directly to the stomach of the insect from which they migrate within two days to the thoracic muscles, and here they get thicker and lose their motility for a short while, but soon after moulting become slender and motile again and migrate to the head and proboscis of the fly, and when the fly bites man, they escape via the proboscis to enter through the skin. The treatment consists in the early detection and removal of the subcutaneous tumors. In the town of Moca, the Commission was able to cut the number of infected from forty per cent to four and one-half per cent in two years and the wild fly infection from five per cent to one per cent. Many slides were shown to demonstrate these points.

The same form of the disease occurring in one region of Africa was recently studied by the Harvard Commission, and moving pictures were shown of some of the work done there. Here, too, are ravines with streams running through them which act as breeding places for the species of fly that transmits the microfilariae. In some areas almost every native was found to be infected with the disease, and many were blind from it in the village where most of the work was done. A laboratory and clinic were established for the study, diagnosis, and treatment of the condition. The diagnosis of infection may be made by section and microscopical examination of the skin, and often small pieces of conjunctiva are used. After the eye lesions have once seriously interfered with vision, it cannot be restored. Thirty-three per cent of the wild flies in this region were infected. These flies prefer to bite in the shade and often infect the natives working in the cotton fields when they go for their water or when they are swimming. The treatment here is likewise the removal of the tumors, but many of the patients were so heavily infected, carrying from one hundred to two hundred nodules, that it was practically impossible to rid them of the disease. When there were only a few, they were removed easily with novocaine. A study was made to see if a mammalian intermediate host existed for the disease. Parasites were found in practically all of the wild animals studied, and Doctor Strong noted that wart hogs as on previous occasions were infected with echinococcus cysts. Eland antelope and further south fifty per cent of the cattle were found to be infected with Cenchocerea.

Bibanga is a center of sleeping sickness. Moving pictures were shown of the different stages of the disease. In the third stage the victims become emaciated and sometimes maniacal, so that their feet must be put in locks to restrain them. They rarely live more than one year in this stage. In the earlier stages the symptoms are fever, chills, and headache, and somewhat later the patient becomes depressed and markedly lethargic so that he is apt to fall asleep even in the blazing sun. Hyperesthesias and sore muscles are common. The treatment of this condition consists of weekly injections of tryparsamide for twelve doses. Some of the natives are trained to do this work as well as to examine the blood for diagnosis or to do lumbar punctures in the later stages.

Moving pictures of a camp of lepers in this same town were also shown. There are five hundred of them, and all forms of the disease are found here. They are treated with chaulmoogra oil and its esters.

BOSTON SOCIETY OF BIOLOGISTS

A meeting of the Boston Society of Biologists was held on March 20 at the library of the Children's Hospital. Dr. George B. Wislocki presided. The first speaker of the evening was Dr. Harold L. Weatherford, who spoke on "The Influence of Anaphylactic Shock on the Finer Structures of the Liver in the Dog." After he had sensitized his dogs with egg albumen over a period of three weeks he inserted a glass cannula into the thoracic duct in order to measure the rate of flow of lymph, before and after the final injection of the protein. In the sensitized animals there is a period of primary shock following the injection of the protein to which they have been sensitized. Following this there is secondary shock. Histological study of the liver showed in primary shock an acute congestion of the organ. The sinusoids and central veins become dilated, and there is a marked increase of lymph-flow up to as much as eight and a half times the normal. The maximum effect on lymph-flow occurs in about fifteen minutes after the injection. There is a marked dilatation of the lymph vessels in the liver. In primary shock, the liver parenchyma shows only slight cloudy swelling and other minor changes; but in secondary shock there is marked damage of the hepatic cells with typical cloudy swelling, granular degenerations, and free hepatic cells are frequently detached and seen floating in the sinusoids and central veins. Later there is a hydropic necrosis of cells with hyaline degeneration and a complete dissolution of nuclear elements. The endothelial lining is pushed away and occasionally broken. There is

definite infiltration with numerous polymorphonuclear cells, some lymphocytes, and occasional histiocytes. The Kupffer cells become vacuolated and some of them heavily pigmented. Frequently whole erythrocytes may be seen not only within the Kupffer cells, but in the bodies of the hepatic cells in the centers of the lobules.

In primary anaphylactic shock the mitrochondria becomes swollen and vacuolated, and may be completely lost in the central part of the liver lobule. In the secondary and more severe type of shock there is a complete loss of mitrochondria in the central part of the lobule and in the inner part of the midzone. Throughout the lobule groups of dark cells are occasionally seen which show extensive degenerative changes and, although these cells may occasionally lie in the periphery, they are distinct from the normal row of peripheral dark cells.

In summary it may be said that anaphylactic shock is associated with a marked passive congestion and a definite fall in arterial blood pressure. The fluid passes out of the capillaries as lymph and the deprivation of oxygen to the vessel walls facilitates the process. There are probably definite toxic elements formed from the degenerating hepatic cells, and Doctor Weatherford believes that the smooth muscles play only a minor part in the contraction of the vessels. Probably this contraction is due to the toxic elements liberated from the hepatic cells.

Dr. Henry I. Kohn spoke on "Concerning the Rôle of Chlorophyll in Photosynthesis." In the past twenty years it has been shown that chlorophyll is closely related to the hemin molecule, but that magnesium is used in place of iron. The molecular weight is about nine hundred. The process of photosynthesis has never been carried out in vitro. We may think of the action of chlorophyll as essentially that of an enzyme. By using brief intensive flashes of light properly spaced the ratio of chlorophyll to carbon dioxide per flash may be found, and this has been calculated to be about two thousand, indicating that this number of molecules of chlorophyll is needed to convert one molecule of carbon dioxide into sugar. By comparing this with other vital processes it would seem that the chlorophyll which is extracted from plants must be changed by the extraction process. The true chlorophyll in the living plant is probably a much larger and more complex molecule than the extracted form. Other types of enzymes give values about one thousand times as great as in the value procured above. Doctor Kohn concluded that the differences may best be explained by assuming that chlorophyll is radically modified by extraction.

Dr. Fuller Albright spoke on "The Locus of Action of the Parathyroid Hormone." In the investigation of any endocrine gland it is necessary to study more especially the hormone secreted by the gland and the hormone's mode of action, besides examining the great number of possible secondary reactions and influences exerted on the rest of the body.

One group led by Collip believes that the parathyroid affects the bones directly, and extracts calcium by the action of osteoclasts. Another group headed by Jaffé considers that the environment of the bone is so changed that calcium and phosphorus are absorbed, and later the osteoclasts remove the débris. Doctor Albright believes that the bone changes are secondary to the calcium and phosphorus changes in the blood and urine. Slides were shown to demonstrate the chief points. In typical hyperparathyroidism we see bone being absorbed very rapidly in association with numerous osteoclasts, and as a result of the stress and strain on the bone numerous osteoblasts are stimulated to lay down osteoid tissue. Collip thinks that the osteoclasts are directly stimulated by the hormone, but Doctor Albright believes that the primary change is the increased excretion of phosphorus in the urine which leads to a decreased phosphorus in the blood, and this in turn necessitates a high blood calcium. The reasons for this belief are summarized below.

In hypoparathyroidism there are no bone changes, and it seems hard to believe, consequently, that there can be a direct action on the bone. On the other hand, if the hyperparathyroid patient eats a high calcium and phosphorus diet, he can recalcify his bones, and, therefore, the bone changes are reversible. Recently cases of hyperparathyroidism have been found with no skeletal disease. Phosphatase is thought to be excreted by the osteoblasts and therefore is an index of their activity. The serum values of this enzyme are increased in hyperparathyroidism when there are bone changes but this is not true where there are no skeletal changes. Furthermore, bone biopsy of these patients shows no evidence of osteoblastic or osteoclastic activities. For these reasons it seems probable that the bone changes are entirely secondary and will not occur if there is a high enough calcium and phosphorus intake.

In the discussion it was brought out that a high phosphorus diet is dangerous to the kidneys, and that if the blood calcium is raised to too high a level, a fatal outcome may ensue. Doctor Wislocki pointed out that there is increasing evidence that the osteoclasts do not play a significant rôle in phagocytosis of bone; according to recent work they probably represent degenerating osteocytes, which have coalesced to form giant cells. The resorption of bone appears for the most part to be a chemical affair unrelated to any activity of the osteoclasts. In hyperparathyroidism the ionized calcium is chiefly affected but the proteinate is also increased slightly, although the serum protein values remain the same.

FAULKNER HOSPITAL CLINICAL MEETING

The regular monthly clinical meeting of the Faulkner Hospital was held at the hospital at 5:00 P.M. on Thursday, April 4.

The first case taken up for discussion was that of a woman forty years of age who died in what

appeared to be uremic coma, although during her stay in the hospital her blood pressure was never appreciably elevated and she was passing a reasonable amount of urine. The urine contained blood and pus. There was fever, leukocytosis and pronounced pain in the right flank and right upper quadrant of the abdomen. At one time acute cholecystitis was considered but this was ruled out by the x-ray studies after the dye had been given by mouth. Pyelograms showed what appeared to be a hydronephrosis on the left side with a fairly normal pelvis on the right. There was practically no elimination of phthalein from either kidney and the nonprotein nitrogen was found to be 210 mgm. per 100 cc. of blood. At autopsy much to everyone's surprise there were found congenital cystic kidneys which had become infected in both pelves; an abscess had developed in the upper pole of the right one, which probably caused symptoms suggesting cholecystitis, and there were numerous hemorrhages into the cysts in both. Just how the infection had taken place was not clear. Although large enough to be felt, neither kidney had been felt during life and they were not the markedly enlarged congenital cystic kidneys which are generally seen. On looking back at the x-ray pictures the point of importance which was stressed by the roentgenologist was the fact that both kidney outlines were indefinite, and therefore suspicion of something unusual in the contour was indicated. In view of the fact that there was no sustained elevation of the blood pressure or evidence of marked uremia, it was felt that the uremia was accelerated by the acute infection and that if the acute infection had not been superimposed the congenital kidneys might have functioned for some time longer.

The other case was one of typhoid fever in which the patient apparently had been ill without proper adjustment to it for some time, because within a few days of the first visit by a physician there was severe and persistent hemorrhage from the intestines until the fatal termination. The appearance of the abdomen was the striking feature in the case because there was no distention, in fact the abdomen was somewhat retracted, despite the presence of many deep ulcerations and much hemorrhage.

Following the presentation of these cases Dr. James M. Baty gave a very interesting talk on "The Anemias of Infancy." He presented a series of clear and descriptive lantern slides. The first showed the difference in the blood forming organs, namely, liver, spleen and bone marrow in infants, in children and in adults. He called attention to the fact that at birth the infant has a normal blood count, sometimes slightly elevated; then for the first three months there is a steady drop in hemoglobin and red blood cells, and following this there is a gradual rise until the blood returns to normal by the second year.

He had studied one thousand consecutive admissions to the Infants' Hospital and an equal number to the Children's Hospital. There was anemia in 35 per cent of the infants and 20 per cent of the children. He then discussed the anemias in the infants. The cause of these anemias was infection in 61 per cent, dietary disorders in 17 per cent, and in 7 per cent the mother was anemic during the pregnancy. The remaining causes of anemia were in groups comprising 3 per cent or less.

He called attention to the fact that during the acute stage of any infection the usual agents which tend to build up the blood are not effective. Following the subsidence of the infection the blood tends to improve, but this improvement can be accelerated by the use of iron or liver extract or both. During the acute stage of infections, transfusions are sometimes helpful, and his impression is that frequent small transfusions are probably better than one large one. He suggests 10 cc. of blood per pound of body weight but not above 200 cc. irrespective of the weight.

In the dietary anemias he called attention to the fact that there may well be an iron deficiency due to lack of assimilation and that the important point is to improve the absorption of iron.

An experiment with the use of ultra-violet rays in dietary anemias with the chance that rickets might be a factor although not apparent, failed to show any value from the rays.

Infants born from anemic mothers have a normal blood at birth, but very quickly develop anemia which persists throughout the first year. If the mother is treated during the pregnancy for her anemia, the infant does not develop this anemia during the first year.

There is a distinct physiological anemia in premature infants. Here again the blood is normal at birth but the anemia reaches a peak in about ten to twelve weeks. This tends to correct itself without treatment.

The result of Dr. Baty's studies emphasized the fact that the important treatment is to remove the cause. The recovery from these anemias can usually be accelerated by the use of iron. There are various ways of administering iron. His favorite is iron and ammonium citrate which is given in orange juice or water and occasionally in milk, although with milk some of the iron is combined and rendered ineffective. There is a new preparation under the name of Feosol which seems to be quite satisfactory and does not require quite so large a dose. He emphasized the importance of not starting with the maximum dose of any iron preparation, because it may cause a gastric upset. The dose of iron and ammonium citrate is 30 to 40 grs. a day in infants; 60 to 75 grs. a day in children and 90 to 120 grs. a day in adults. In an occasional case, liver seems to be of distinct assistance in addition to the iron and recently it has been suggested that copper is also beneficial.

HARVARD MEDICAL SOCIETY

At the February 26 meeting of the Harvard Medical Society at the Peter Bent Brigham Hospital, Dr.

Cheever presided. The first case was presented by Dr. White. A sixteen year old boy entered on the first of December with a swelling of the legs and thighs of six months' duration, and acute abdominal pain for three days. At the age of three he had swelling of his eyes and body with urinary signs of nephritis. Last July he developed pain and edema in his legs and eyelids. Physical examination showed a pale boy with acne of his face and swelling of his eyelids, scrotum, and extremities. His red count was normal and he had a hemoglobin of eighty-five per cent. His white count has varied from six thousand to nineteen thousand. His blood cholesterol was 1660 which is the highest recorded in the hospital, and his total plasma protein was 3.7 grams per 100 cc. A diagnosis of nephrosis was made and diuretics were used without any effect. On the eighth, ninth and eleventh of February intravenous injections of gum acacia were given. Apparently as a result of this therapy he lost ten kilograms of weight within a few days and the blood chemistry showed a total plasma protein of 1.9 per cent, and a cholesterol of six hundred and twenty milligrams per cent. Dr. Marshall N. Fulton discussed the case and said that the chief factor in the persistence of the edema is the low plasma protein, and that in this case an attempt was made to increase the osmotic pressure by the use of gum acacia. The patient had lost weight out of proportion to the diuresis, and had continued to lose weight after the diuresis stopped. It is difficult to raise the plasma protein in such patients by a high protein intake, although a normal renal function allows such an excessive intake without injury to the kidneys. The patient is still putting out a trace of albumin in the urine. The high cholesterolemia is probably the result of a disturbed fat metabolism.

The second case was presented by Dr. Harrison. A forty-one year old man entered with a history of pain since November in his shoulder especially when he was tired. Six weeks before entry a lump appeared in the upper part of the right shoulder and there had been some limitation of motion for the week before entry. In 1929 he had a gastric hemorrhage and an ulcer was demonstrated by x-ray. Physical examination showed a well-developed man without any abnormality except the local lesion which was a firm round tumor over the lateral third of the right clavicle. The white count was slightly elevated. There was no inflammation or pulsation of the mass on entry. During his stay in the hospital there had been a slight fever.

Dr. Sosman demonstrated the x-ray films on this case and showed that there was a definite softening of the bone with parallel new bone formation underneath, and some new bone formation above the clavicle, but also some destruction. The lesion was considered either a new growth or an inflammatory condition, the most common diagnosis in a man of his age being either osteogenic sarcoma or a Ewing's tumor. Dr. Homans said that he could not conceive of this being osteomyelitis, and Dr. Cutler thought that the x-ray showed some perpendicular bone formation which is typical of an osteogenic sarcoma. Dr. Sosman held that x-ray treatment in this case would give good palliative results but no cures had been obtained by radiation alone and he therefore advised radical surgical treatment.

Dr. John A. Hartwell spoke on "Your Profession and Society." His address appeared in the March 28 issue of this *Journal*.

In the discussion Dr. Cheever said, "It is unfortunate that students are not taught more of this side of medicine." Dr. Cutler pointed out that fee splitting is a common practice in many sections of the country and is one of the public's sources of distrust of the profession. Any infringement of ethics makes the problem more difficult to solve. Then Dr. Homans said that in these days when everyone has financial troubles the doctor cannot help thinking about earning his living, and that, therefore, his advice may at times be influenced by this condition.

THE NEW ENGLAND HEART ASSOCIATION

The New England Heart Association held its monthly meeting in the auditorium of the Beth Israel Hospital on Monday, January 28, 1935, at 8:15 P.M. Papers were presented by members of the Medical Research Staff of the Beth Israel Hospital. The speakers were introduced by Dr. Herrman L. Blumgart and each paper was followed by a brief discussion.

Dr. Louis Wolff presented a paper on the coexistence of auricular and auriculoventricular nodal tachycardias, and its treatment with quinidine sulphate. He pointed out that digitalis may provoke auricular or ventricular tachycardia, and that the patient under discussion was suffering from digitalis intoxication on admission to the hospital. Doctor Wolff obtained good results by the use of quinidine sulphate in this patient, and discussed the mechanism by which the abnormal tachycardias were abolished.

Dr. J. Riseman spoke on changes in blood pressure and heart rate in angina pectoris. In the cases studied, attacks of angina pectoris were induced under direct observation by a standardized exercise tolerance test. The observations showed that the systolic blood pressure at the onset of such attacks of angina was higher in some patients, lower in others, and essentially the same as the blood pressure at rest in a third group. It was concluded that the blood pressure changes are of no diagnostic value, and the onset of angina pectoris is not dependent on a rise in blood pressure. The changes in heart rate immediately before the onset of the attack likewise showed considerable variation and were influenced by the amount of exercise necessary to induce angina rather than by the attack itself. The dangers involved in performing the exercise test were discussed, and the advantages of this over other tests were emphasized.

A paper was presented by Dr. Morton Brown on "Some Clinical Observations on the Treatment of

Angina Pectoris." The clinical evaluation of the various drugs is furthered by the use of an objective tolerance test. The patient's usual estimate of the duration of an attack of angina pectoris, for example, is about five minutes, whereas accurate timing reveals it to be seldom more than two and a half minutes. Doctor Brown has studied the effect of a number of drugs on the exercise tolerance of a series of patients with angina pectoris. In some patients he found definite clinical improvement and an increased exercise tolerance after treatment for a week with one of the following drugs: aminophylline, erythroltetranitrite, phenobarbital, and quinidine.

"The Mechanism of Early Relief of Pain in Angina Pectoris after Thyroidectomy" was the subject of a paper by Dr. A. A. Weinstein and Dr. H. Hoff. The immediate relief of pain following thyroidectomy in many patients has been found to last from a few days to several weeks, the pain then returning unless the necessary fall in basal metabolic rate had occurred. It has also been observed that unilateral cervical sympathectomy often gives relief of pain in angina pectoris only on the corresponding side. Following this lead, a number of patients with angina pectoris selected for two-stage total thyroidectomy were studied for relief of pain after hemithyroidectomy. After hemithyroidectomy it was found that relief was obtained only on the side operated upon. Areas of bone and muscle tenderness over the chest were tested in several cases during the procedure of thyroidectomy. In these patients it was found that the tenderness usually disappeared on the corresponding side as soon as one of the thyroid arteries was ligated and sectioned or the thyroid was freed from its bed. After the pain and tenderness had returned, relief could again be obtained temporarily by injection of the stellate ganglion with novocaine. These observations indicate that the immediate relief of pain in these cases was due to interruption of nerve pathways in the neck bearing impulses from the heart to the sensorium. Doctor Weinstein and Doctor Hoff have found a close association between the cardiac nerves and the posterior aspect of the thyroid in many dissections of fetuses and adults. In some dissections, however, no association could be demonstrated. This is in accordance with the observation that in some cases there is no immediate relief of pain, the relief appearing only after there was an adequate fall in the basal metabolic rate.

Dr. M. D. Altschule presented a paper on "The Cardiac Output and the Work of the Heart in Hypothyroidism." Employing a modification of the formula of Evans, the work of the heart was taken to be the product of the minute volume output and the peripheral resistance. The work of the heart was found to parallel the cardiac index (the minute volume output of the heart per square meter of surface area which is normally 2.2 ±.3). There was a similar correspondence between the cardiac index and the velocity of blood flow, with rare exceptions. A distinct fall in the cardiac index was found following total ablation of the thyroid, associated with the fall in basal metabolic rate. At the same time the arteriovenous oxygen difference was found to rise progressively so that the decrease in cardiac output was greater than the fall in basal metabolic rate. It was concluded that the permanent relief following total ablation of the thyroid is due to the establishment of a decreased demand upon the heart.

Dr. D. Davis presented "Results of Total Thyroidectomy in Twenty-Seven Patients with Congestive Failure One to Two Years After Operation." Fifteen were females and twelve males. The ages varied from eighteen to sixty-six. Eighteen were rheumatic and six were arteriosclerotic heart patients. One was a luetic, one a hypertensive, and one a patient with cor pulmonale. Sixteen were chronic fibrillators and three of these had had embolic phenomena. The twenty-seven patients included the first group of consecutive patients who had survived thyroidectomy by at least six weeks. Eleven of these twenty-seven, or forty-one per cent, remained considerably improved for a period of at least one year or longer and eight of these either did light work or were able to during this time. Six other patients were likewise appreciably benefited by the operation, although the marked improvement was not maintained for a full year in all six. Seven other patients showed only slight improvement, and three patients failed to show any improvement. Thus, sixty-three per cent were benefited by the procedure and the majority of these maintained their improvement with an increased capacity for activity for more than a year after thyroidectomy.

The final speaker of the evening was Dr. J. Riseman, who presented "The Results of Total Ablation of the Thyroid on Cardiac Asthma and Angina Pectoris." He divided his series of twenty-three patients with cardiac asthma into three groups. A first group of twelve cases has gone from six to nineteen months without return of cardiac asthma. A group of five cases showed only temporary improvement. The third group of six patients showed no improvement. Hence, in unselected cases of cardiac asthma there is symptomatic relief in fifty per cent of the cases, which compares favorably with any other form of treatment for this disease. He next presented a series of thirty-six cases of angina pectoris. Twenty-five of these were patients with pure angina pectoris without other cardiac disability. A group of ten cases has shown satisfactory results with either no attacks or attacks so mild and so infrequent that they were able to return to work. Five patients have shown a marked decrease in the severity of the attacks. A third group of five patients has shown no significant improvement. All of a fourth group of five patients have died since the operation without improvement. As a rule, notes on the clinical course of the patients checked well with the results of the exercise test, but in the group with clinically no significant improvement there was definite improvement demonstrable in some cases by

the exercise tolerance test. Eleven of the thirty-six cases were complicated by cardiac asthma or congestive failure. In nine of these cases there have been no attacks of angina since thyroidectomy. The preoperative basal metabolic rates were within normal limits in those patients who showed satisfactory improvement following operation, while those individuals who showed temporary or slight improvement as a rule had low basal metabolic rates before operation. It was concluded that the operation has been of definite value in selected cases of angina pectoris.

MASSACHUSETTS PSYCHIATRIC SOCIETY

The Massachusetts Psychiatric Society held a meeting in the Boston Psychopathic Hospital on the twenty-seventh of February. The first paper was presented by Dr. Salomon Gagnon on "A Review of the Problems of Bacillary Dysentery." Bacillary dysentery is an important problem in all institutions and there have been many epidemics, especially in those devoted to mental disease. Some statistics show a mortality as high as twenty-five per cent. Carriers are frequent, and fatal cases are almost invariably in elderly, debilitated patients. The state institution at Danvers had an epidemic of this disease starting in 1931 which reached its peak in June, 1932. The mortality during 1932 was nineteen per cent. The records show another similar epidemic in 1908, although it was caused by a slightly different type of organism, and the mortality was twenty-three per cent.

In spite of great precautions, dysentery is still a great problem. The water supply, food, and milk should be checked; carriers should be treated and patients isolated. Oral as well as subcutaneous vaccines were tried and while there are no definite statistics available at present to determine the results, it may be said that there have been no bad reactions from the administration of vaccine, and that there have been no cases yet in those patients who received vaccine by the subcutaneous route, although eighteen cases of dysentery developed in those receiving oral administration.

The clinical picture of bacillary dysentery consists of a sudden onset, usually without prodromal symptoms, with a high temperature up to one hundred and five degrees and a watery, blood-streaked diarrhea, which has a peculiar, typical, foul odor. The pulse is rapid, the patient is prostrated, and the temperature usually returns to normal within twenty-five to forty-eight hours. In the early stages cultures of the feces are usually positive and somewhat later agglutination tests of the patient's serum become positive. Several negative stool cultures do not definitely eliminate the diagnosis of dysentery. In the epidemic mentioned above only thirty-two per cent gave a positive stool culture. Pathologically shallow ulceration is found in the colon and to a less extent in the lower portion of the small intestine.

The treatment is similar to that of any diarrhea, and consists of enemata, astringents, opium, and dietary care, as well as sanitary measures, isolation, special nurses, precautions to disinfect the linen and excreta, and inspection of the food and water supplies. It is important to screen these patients carefully to avoid spreading the disease by means of flies. The quarantine period is six weeks or until several successive cultures have become negative.

In conclusion it was stressed that bacillary dysentery is a common and serious disease in mental hospitals with a high morbidity and mortality, which is especially fatal in the debilitated patient. Certain clinical symptoms are important, but cultures are preferable in diagnosis and vaccination is logical, although its value has not been demonstrated.

In the discussion which followed, it was pointed out that diarrhea is common in the general public but that these cases are not reported, so that the institutional figures appear worse than they really are.

Dr. Leo Maletz spoke on "Sodium Fluoride Poisoning," and presented a fatal case of this condition which occurred at the Danvers State Hospital. Sixty-five fluoride poisoning cases have been reported in the literature with a mortality of fifty-five per cent. Sodium fluoride is commonly used in insecticides, especially roach powders, is commonly stored on the kitchen shelf, and may thus be accidentally used in foods. Clinically the symptoms and signs are essentially due to calcium deprivation with a resulting tetany and irritability of the muscles. The coagulability of the blood is abolished and within five minutes after the intake of the poison the patient complains of severe epigastric pain, vomiting, burning, cramps, and diarrhea. There are spasmodic contractions of the legs, cyanosis, and shock. Death usually occurs in from three-quarters of an hour to four hours, although occasionally the patient lives twelve hours. Death is due to failure of the cardiorespiratory center and usually occurs suddenly. Treatment consists in the administration of a ten per cent aqueous solution of calcium chloride which precipitates the fluoride. The tetany is combated by an intravenous injection of ten per cent calcium chloride or parathormone.

The case occurring at Danvers recently was a forty-one year old kitchen worker who had prepared some hard sauce in which he had used powdered sugar. He sampled it, and in a few minutes felt sick and was overcome by weakness, nausea, and vomiting. He was given a gastric lavage and shock treatment. A saline purgative was administered. Several hours later he complained of muscular cramps, especially of the facial muscles, and suddenly, some six hours after the onset when he seemed to be much improved, he suddenly died. His white blood count was twenty thousand with ninety-one per cent polymorphonuclear cells. The blood calcium was 5.8 milligrams per cent. At autopsy his face was distorted and there was a continuous oozing of dark blood from the wounds with many epicardial hemorrhages, and numerous reddish patches throughout his body in all the organs.

The source of the fluoride was found to be in the powdered sugar which had been contaminated with roach powder. Chemically fluoride was found present in the stomach, intestinal contents, liver, spleen, heart, brain, and heart blood. Because of the high toxicity, anything containing fluoride should be labeled "poison" and discolored. At the present time at Danvers small amounts of lamp black are added.

Dr. Paul Tivnan spoke on "Paget's Disease." The term "osteitis deformans" was first used in 1873 by Czerny, and Paget wrote his original article in 1876 with the report of five cases. Since this time five hundred cases have been reported in the literature. This disease rarely occurs under the age of thirty, or over the age of sixty. The onset is usually slow, and is first noticed by the patient when it is found that his head is getting too large for his hat and that he is becoming shorter. Seventy per cent of the cases have pain as the first symptom which varies from mild discomfort to an occasional pain in the lower extremities. Generalized headache may occur. The pain may arise from the stretching of the periosteum, compression of the sensory nerves, arterial involvement with claudication, or coincidental arthritis. If most of the bones are involved the head becomes larger and there is a marked kyphosis, a rigid spine, a broad pelvis, and a bowing of the extremities, so that the individual walks with a waddling gait and may shrink as much as eight inches.

Pathologically the first change occurs at the site of a nutrient artery and there is sclerosis. Later this sclerosis becomes diffuse and spreads up and down the bone, or there may be multiple areas of involvement. Later the original areas may lose their characteristic sclerosis and show a fibrous infiltration with a destruction of the transverse trabeculae which results in an enlargement of the bone and a loss of weight-bearing power. Still later the longitudinal trabeculae are destroyed, and cystic degeneration occurs. In the skull where there are many nutrient arteries from both the dura and the scalp, there is a diffuse sclerosis with a typical appearance of "curly wool" on x-ray examination. The bone is broken down by osteoclasts and fibrous infiltration.

The bowing which occurs in the upper extremities is due to the pull of the muscles and is usually greater in the arm that is most used. Cyst formation is commonest in the pelvis. Fractures are common, although the literature often states that they are rare. Seven per cent undergo sarcomatous degeneration. One of the outstanding characteristics is early and advanced arteriosclerosis, and eighty-five per cent of the patients show marked changes in the peripheral vessels. Fifty per cent have hypertension.

Biochemically there is an increase in the phosphatase content of the blood which may reach twenty times the normal value. The neurological manifestations may be due to compression of nerves or arteriosclerotic changes. The extreme thickness of the calvarium frequently involving the base of the skull with a narrowing of the posterior fossa and a depression of the anterior fossa may lead to marked pressure symptoms involving the cranial nerves, especially the optic and auditory nerves, as well as the cerebellum and medulla. The vertebrae are often involved and may encroach upon the spinal cord, giving symptoms. The mental changes which have been noticed from time to time in these cases are due to arterial changes or compression of the brain, or a change in the internal secretions may play a rôle. The etiology is unknown.

In the discussion Doctor Raeder showed a chart of the different shapes of heads in endocrine disturbances. That characteristic of Paget's disease is large and round. A patient with Paget's disease was reported with petit and grand mal attacks followed by deterioration, but no other similar case is reported in the literature.

TWINS AND SOCIAL BIOLOGY

Dr. G. H. Parker gave the Sunday lecture at the Harvard Medical School, March 10, on "Twins and Social Biology." He said there are two underlying principles by which people develop. The first is inheritance, which cannot be altered; and the second is that which we assimilate from our surroundings. He stressed the point that every trait is a combination of both elements, although one or the other usually predominates. The study of twins is an important method used to analyze the influence of environment and heredity. One pair of twins occurs in every ninety births, triplets about one in eight thousand births, and quadruplets about one in half a million births. There is apparently one authentic case of sextuplets.

The diversity and individuality seen in human beings are apparent throughout the animal kingdom, and Doctor Parker fully demonstrated the reason for this. In the adult cell there are twenty-four pairs of chromosomes which carry the genes which are responsible for hereditary characteristics. The reproductive cells lose one-half of their total chromosomes in the process of maturation, and it is mere chance as to which one of each pair will disappear. This allows something over sixteen and a half million possible combinations in each of the parent cells, so that each fertilized egg will have somewhat over two hundred and eighty-one trillion possible combinations of hereditary characteristics.

Four pairs of twins out of five are ordinary or dissimilar twins, and are as different as any two children in a family. One out of five pairs, however, is an identical pair which are always of the same sex and are much alike both physically and mentally, even to minute details. Ordinary twins come from separate eggs, but identical twins originate from one single egg, and, therefore, have exactly the same heredity. The armadillo gives birth to four young, all of which come from one egg. Since identical twins are from the same egg they may not always fully separate, and it is the various stages of separation that give rise to

Siamese twins and other double monsters. Because the heredity of similar twins is so closely the same, they become excellent subjects for the study of the effects of environment.

Several cases of separation of identical twins have been studied and the differences noted. Physically no differences become manifest, but it has been concluded that environment plays a definite part in deciding the characteristics of a person. The mental ability remains the same, and there has been a striking case reported where both members were afflicted with dementia praecox after they had become separated. Doctor Parker cited a case of identical twins being born to a vagrant mother where the children were placed in separate families, and both had good surroundings and excellent opportunities to develop their character. However, when they became of school age they both were truants and later both met at Sherborn. From this it would seem that tendencies to vagrancy are apparently inherited, and it has been found that criminality is much greater in the mates of identical twins than in the mates of ordinary twins. Doctor Parker concluded from these studies that we are all pretty much what we are through inheritance, although we each have a fringe of freedom in which we can influence character by our surroundings. He believes that human character is strongly predetermined, and that the amount of freedom in personality development is limited.

The question has arisen of how to take care of defective individuals. Huge sums of money are spent each year on the care of defectives. It is obvious from our present social ethics that we must care for these people, but it is only fair that we should also prevent them from further propagation. This has been attempted by a method of segregation in Massachusetts, but it is not very effective, and prevents them from at least partially supporting themselves in the community. The other obvious way to control propagation of these defectives is to sterilize them, and thus prevent childbearing. The modern operations are simple and do not disturb any of the normal functions of the body, sexual or otherwise, except that such persons are sterile. The glands are left intact. This procedure is now legal in twenty-eight states of the Union, and about sixteen thousand sterilizations have been carried out. It is a court procedure, and has been given the longest trial in California. It is highly advisable that Massachusetts likewise do something along this line to prevent further propagation of hereditary defectives, and the day is not far off when the situation must be met.

MASSACHUSETTS HOMEOPATHIC MEDICAL SOCIETY

Dr. Ray W. Spalding of Boston was reëlected president of the Massachusetts Homeopathic Medical Society at its annual meeting. Addresses were delivered by Dr. Eleanor B. Ferguson, Dr. Herbert H. Smith, Dr. W. D Rowland, Dr. John P. Sutherland and Dr. John Garth Boericke, professor of homeopathy and materia medica at Hahnemann College.

STAFF CONFERENCE OF THE J. B. THOMAS HOSPITAL

The second monthly Staff Conference at the J. B. Thomas Hospital was held Tuesday evening, March 19, 1935.

Dr. Samuel Levine, of Boston, guest speaker of the evening, gave an interesting talk on "Factors Concerning Prognosis in Heart Disease," followed by a general discussion.

Members of the staff, local physicians, dentists, graduate nurses and students were in attendance.

This was the second of the series of such clinical conferences which are to be held to present practical questions of medical and surgical interest.

WILLIAM PATTEN MCHUGH, M.D.,
Staff Secretary.

ESSEX NORTH DISTRICT MEDICAL SOCIETY

The 95th Annual Meeting of the Essex North District Medical Society will take place at the Anna Jaques Hospital in Newburyport on Wednesday, May 15, with the following program:

Hospital ward rounds at 11:30.

Business meeting at 12:30.

Dinner at 1.

Discussion at 2 P.M. on "Some Practical Highlights in the Management of Diabetes" by Dr. Elliott P. Joslin, followed by Dr. Channing Frothingham's discourse on "Physicians, Patients, and Pay."

ELMER S. BAGNALL, M.D., *Secretary.*

NEW ENGLAND SOCIETY OF PSYCHIATRY

ANNUAL MEETING

The Annual Meeting of the New England Society of Psychiatry will be held at the Boston Psychopathic Hospital, Boston, April 26. Buffet luncheon will be served at 1 P.M. Business meeting at 2 P.M.

HARLAN L. PAINE, M.D.,
Secretary-Treasurer.

HAMPDEN DISTRICT MEDICAL SOCIETY

The Annual Meeting of the Society will be held at Hotel Kimball, Springfield, Mass., on Tuesday, April 30, at 4 P.M.

Regular business and reëlection of officers for the ensuing year.

Paper for the afternoon:

Practical talk on "Allergy," Dr. I. Chandler Walker of Boston.

Discussion by Fellows.

Supper at 6 P.M. at expense of Society.

Censors meet for the examination of candidates in the rooms of the Springfield Academy of Medicine on Thursday, May 2, at 4 P.M.

HERVEY L. SMITH, M.D., *Secretary.*

FRANKLIN DISTRICT MEDICAL SOCIETY

The Annual Meeting of the Franklin District Medical Society will be held at The Weldon, Greenfield, on May 14, 1935, at 11 A.M.

PROGRAM

Annual Report of Secretary.
Annual Report of Treasurer.
Economics.
General Discussion by members of the Society.

H. B. MARBLE, M.D., *President*,
CHARLES MOLINE, M.D., *Secretary*.

GREATER BOSTON MEDICAL SOCIETY

SPECIAL MEETING

Time: Tuesday, April 30, 1935, 8:15 P.M.
Place: Beth Israel Hospital Auditorium.
Speaker: Frankwood E. Williams, M.D., of New York.
Subject: "The Relation of the Physician to the Problem of Economic Security."
Open discussion.

H. L. BLUMGART, M.D., *President*,
D. B. STEARNS, M.D., *Secretary*.

A subscription dinner will be held in honor of Dr. Williams at the University Club at 6:30 P.M. before the meeting. Any member may make reservations by telephone and by sending $1.25 to the Secretary before April 28.

SUFFOLK DISTRICT MEDICAL SOCIETY

CENSORS' MEETING

The Censors of the Suffolk District Medical Society will meet for the examination of candidates at the Medical Library, 8 Fenway, Thursday, May 2, at 4:00 o'clock.

Candidates should make personal application to the Secretary, and present their medical diplomas at least one week before the examination.

GEORGE P. REYNOLDS, M.D., *Secretary*.
311 Beacon Street, Boston.

FAULKNER HOSPITAL CLINICAL MEETING

The next meeting will be held at the Faulkner Hospital on Thursday afternoon, May 2. In addition to the usual clinical pathological conference, Dr. F. William Marlow, Jr., will talk on "Latent Ocular Muscle Error" and Dr. Henry M. Emmons will talk on "The Importance of Eye Symptoms in Diagnosis."

All physicians are invited.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

The Annual Meeting will be held on May 8, 1 P.M., at the Winchester Country Club, Winchester.

Speaker: Captain Van Amburgh of the State Department of Public Safety.
Subject: Ballistics.
Election of Officers. Harlow Dinner.

K. L. MACLACHLAN, M.D., *Secretary*.

WORCESTER DISTRICT MEDICAL SOCIETY

The Annual Meeting of the Worcester District Medical Society will be held during the afternoon and evening of Wednesday, May 8. This meeting will be held at the Worcester Country Club. A golf tournament will be participated in during the afternoon. The annual dinner will be held at 6:30 and this will be followed by the business session and the annual oration, which will be delivered by Dr. Roy J. Ward of Worcester.

ERWIN C. MILLER, M.D., *Secretary*.

AMERICAN NEISSERIAN SOCIETY

The first Annual Meeting of the American Neisserian Medical Society will be held at Hotel Claridge, Atlantic City, New Jersey, June 11, 1935. The program contains addresses by the following speakers:

M. L. Brodny, M.D., and E. Granville Crabtree, M.D.; Charles M. Carpenter, M.D.; Emily D. Barringer, M.D.; Russell D. Herrold, M.D.; J. Dellinger Barney, M.D.; Stanhope Bayne-Jones, M.D.; P. S. Pelouze, M.D., C. C. Norris, M.D., Thomas Parran, Jr., M.D., W. F. Snow, M.D., and Edward L. Keyes, M.D.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, APRIL 29, 1935

Monday, April 29—

11 A.M. Annual meeting of the Massachusetts Tuberculosis League. University Club, Boston.
*8:15 P.M. New England Heart Association. House of the Good Samaritan, 25 Binney Street, Boston.

Tuesday, April 30—

†2:30-4 P.M. Ward Visit, Massachusetts Eye and Ear Infirmary.
†4-5 P.M. Seminar, Pediatric Laboratory, Massachusetts General Hospital.
6:30 P.M. Greater Boston Medical Society. Dinner, University Club, Boston.
8:15 P.M. Greater Boston Medical Society. Beth Israel Hospital Auditorium, Boston.

Thursday, May 2—

*12 M. Clinico-Pathological Conference. Massachusetts General Hospital.
†12 M. Clinico-Pathological Conference. Children's Hospital.
*5:00 P.M. Faulkner Hospital. Clinical meeting.

Saturday, May 4—

*10-12. Staff rounds at the Peter Bent Brigham Hospital. Open to practicing physicians.

*Open to the medical profession.
†Open to Fellows of the Massachusetts Medical Society.

April 26—New England Heart Association, annual meeting, 4:00 P.M. Boston Medical Library, 8 Fenway.

April 26—New England Society of Psychiatry. See page 807.

April 26—The New England Roentgen Ray Society will meet at 8:15 P.M. at the Children's Hospital, 300 Longwood Avenue, Boston.

April 26—Boston University School of Medicine Surgical Clinic at the Boston City Hospital, 12-1, Cheever Amphitheatre.

April 29—Massachusetts Tuberculosis League, Annual Meeting, will be held at the University Club, Boston, beginning at 11 A.M.

April 29—New England Heart Association will meet at 8:15 P.M. at the House of the Good Samaritan, 25 Binney Street, Boston.

April 29-May 3, 1935—The American College of Physicians will meet at Philadelphia. For information address Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

April 30—Greater Boston Medical Society. See page 808.

May 2—Faulkner Hospital Clinical Meeting. See page 808.

May 6-7—Conference on Occupational Diseases, 2 P.M., Hotel Statler, Boston.

May 10—Boston University School of Medicine Surgical Clinic at the Boston City Hospital. See page 795.

June, 1935—Medical Library Association will meet in Rochester, N. Y. For details, address the Secretary: Miss Frances N. A. Whitman, Librarian, Harvard University Schools of Medicine and Public Health, Boston, Mass.

June 11—American Heart Association. The Eleventh Scientific Session will be held from 9:30 A.M. to 5:30 P.M., at the Hotel Claridge, Atlantic City, N. J. The program will be devoted to various subjects on cardiovascular disease. Gertrude P. Wood, Office Secretary, 50 West 50th Street, New York, N. Y.

June 11—American Neisserian Society. See page 808.

June 12 and 13—Academy of Physical Medicine, Annual Meeting, will be held at the Claridge Hotel, Atlantic City, N. J. For further details address: Arthur H. Ring, M.D., Secretary-Treasurer, Arlington, Mass.

June 17 to 21—Convention of the Catholic Hospital Association will be held at Creighton University, Omaha, Nebraska. For information address the Most Reverend Joseph Francis Rummel, D.D., Bishop of Omaha.

June 24-28—American Urological Association and Western Branch Society, American Urological Association, will meet at the Palace Hotel, San Francisco, California. For details write Dr. Charles P. Mathé, 450 Sutter Street, San Francisco, California.

June 27-29 inc.—British National Association for the Prevention of Tuberculosis will be held at Southport, England. Persons desiring further information should write to Miss F. Stickland, Secretary of the Association at Tavistock House North, Tavistock Square, London, W. C. I., England.

July 1-23—University of Freiburg i. Br. will hold a vacation course of the medical faculty. For information address Akademische Auslandsstelle der Universität Freiburg i. Br., Schwimmbadstrasse 8, Germany.

July 22-27—Seventh International Congress on Industrial Accidents and Diseases, Brussels, Belgium. The American Committee of the Congress is under the chairmanship of Dr. Fred H. Albee, New York, for the Section on Accidents, and that of Dr. Emery R. Hayhurst, Columbus, Ohio, for Industrial Diseases. The American delegation to the Congress will sail from New York on July 8 and visit London, Amsterdam, The Hague and Paris, and, optionally, Budapest. Physicians interested in the Congress or in the medical tour in conjunction with it, may address the Secretary, Dr. Richard Kovacs, 1100 Park Avenue, New York City.

October 7-10—American Public Health Association will meet in Milwaukee, Wisconsin. For information address the American Public Health Association, 50 West 50th Street, New York City.

DISTRICT MEDICAL SOCIETIES

ESSEX NORTH DISTRICT MEDICAL SOCIETY

May 15—See page 807.

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

May 8—Annual Meeting. Salem Country Club, Peabody. Dinner at 6 P.M. sharp. **(Note change in time.)**

FRANKLIN DISTRICT MEDICAL SOCIETY

May 14—See page 808.

HAMPDEN DISTRICT MEDICAL SOCIETY

April 30—See page 807.

May 2—Censors' Meeting. See page 807.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

May 8—See page 808.

NORFOLK DISTRICT MEDICAL SOCIETY

May—Annual Meeting. Date, time and place to be announced.

SUFFOLK DISTRICT MEDICAL SOCIETY

May 2—Censors' Meeting. See page 808.

WORCESTER DISTRICT MEDICAL SOCIETY

May 2—Censors' Meeting will be held in the Arts Room of the Worcester Public Library, Elm Street, at 4:30 P.M.

May 8—See page 808.

BOOK REVIEWS

A Text-Book of Pathology. An introduction to medicine. William Boyd. Second Edition. 1047 pp. Philadelphia: Lea & Febiger. $10.00.

The second edition of Boyd's textbook of pathology insures continuation of the popularity and success with which the first edition was presented. From the standpoint of acceptability of material, readableness and accuracy, this book is outstanding. The author not only relies on his own experience, but draws with excellent judgment from the current literature of pathology. This edition is remarkably up-to-date, including subjects generally omitted from textbook consideration, such as von Gierke's disease, medionecrosis of the aorta, the finer subdivisions of the ovarian tumors, and the St. Louis type of encephalitis. The illustrations are excellent and the magnifications of the photomicrographs well suited to the points which it is desirable that they should show. The reviewer wishes, as long as expensive colored plates are included among the illustrations, that one of them might have been of human rather than rabbit pathology. The references for collateral reading are excellently selected and up-to-date. In any textbook that attempts to cover so large a subject in a volume of reasonable size minor flaws can be found, but unless one is definitely hypercritical there is little room for improvement in Boyd's work.

Handedness: Right and Left. Ira S. Wile. 439 pp. Boston: Lothrop, Lee and Shepard Co., 1934. $2.75.

The question of right and left handedness appears to be one of growing interest. It is now believed by many that children who are naturally left handed should not be made to use their right hand, for if this is done, certain types of nervous disorders may appear as the result of this attempt at readjustment. Attention has been called particularly to stammering and stuttering, which, at least in some cases, is definitely connected with an attempt at turning a left-handed person into one who consistently uses his right hand. Dr. Wile has gone into the subject with a very broad point of view. The book is widely documented. The author's researches have led him into many adjacent fields of thought, including the history of the subject, particularly the facts in relation to primitive man, and somewhat analogous features of plant life, such as heliotropism and the religion associated with hand symbolism.

From the physician's point of view the importance of this book lies in the interpretation of the material as applied to children. Dr. Wile concludes that: "From every standpoint, natural handedness should be fostered and conserved. There is nothing useful which can be performed by the right hand that cannot be equally well done by its symmetrically functioning mate." If one ignores this, it seems certain that some types of nervousness may develop

later on in life which may be difficult to cure, even though the patient may go back to his state of natural handedness.

A Manual of the Practice of Medicine. A. A. Stevens. Thirteenth Edition. 685 pp. Philadelphia and London: W. B. Saunders Company. $3.50.

This little book has been revised to cover the most recent work, even including the work on alpha-dinitrophenol and that on agranulocytosis from amidopyrine and other drugs.

The fact that this book has run through thirteen editions shows that it is useful as a manual. It is extraordinarily complete for as small a book as this and is very nicely printed and of convenient size. The contents are accurate and of particular value for the excellent form in which the prescriptions are written. From this point of view it could well serve as a model even for books dealing with therapeutics.

As to the value of a small compend of this sort either for medical students or practitioners there may be some discussion, although the terseness and completeness of his descriptions provide somewhat of a contrast to the discursiveness of many medical texts.

As a book of ready reference and convenient size it can be widely recommended.

The Science and Practice of Surgery. W. H. C. Romanis and Philip H. Mitchiner. Fifth Edition. Vols. I and II. **General Surgery and Regional Surgery.** Philadelphia and London: Lea & Febiger. $13.00.

As in previous editions these volumes cover the entire field of surgery in a clear and concise manner. At no time do the authors lose themselves in a maze of detail, but continue on a high level of perspective from which they describe general outlines. And yet the text is kept from becoming a mere outline by a style that carries the reader along with continuous interest.

It is an admirable textbook, for from it medical students can learn the principles of surgery easily and at the same time feel certain that their knowledge is up-to-date. For those who are away from medical centers it furnishes a guide to new methods of diagnosis and therapy. It is not of great value to one who wishes to learn surgical technique.

In the present edition are much revised chapters on peritonitis, fractures, burns, varicose veins, diseases of the eye and anesthesia.

There are many good illustrations and the workmanship of the book is excellent.

Aids to Psychiatry. W. S. Dawson. Third Edition. 318 pp. Baltimore: William Wood & Company. $1.50.

This small book, printed in England and now in its third edition, is one of a so-called "students' aids series". Designed to help an English medical student cram through an old-fashioned examination for the technical qualifications of "psychiatrist," such a book is both unsound and unsuited to students in America. No attempt has been made to evaluate, or in many cases even mention, the recent advances in the study of mental disease. To borrow a phrase from the case-histories in the Edwin Smith papyrus: a book not to be recommended.

A Summary of the Treatment of Fractures and Dislocations. R. Broomhead. 39 pp. Leeds: Jowett & Sowry, Limited. 3/6d.

Mr. Reginald Broomhead is one of the younger British surgeons, who has accepted heavy responsibilities as head of the large Orthopaedic Department of the General Infirmary at Leeds. "Summary of the Treatment of Fractures and Dislocations" may be truly called "multum" in thirty-nine pages. Part I of the booklet is a general consideration of fractures written in outline form. Part II consists of some thirty-odd pages of treatment. These tables are arranged under headings for fractures of the upper extremity, the lower extremity and the spine, and for dislocations of the main joints. The headings include the region of the fracture, methods of reduction, primary splinting, position, instruction to patients, secondary splinting, methods of physical therapy and the expected time of resumption of work. As Mr. Broomhead says in his preface, the dogmatic statements which he makes in regard to the duration of splinting and of the physical therapy treatment represent only approximate averages. He courteously states that his idea of the summary had its inception in the plan in operation on the Fracture Service of the Massachusetts General Hospital. The brochure is designed for students and for general practitioners. It is to be warmly commended.

One Hundred and Fifty Years of Publishing. 1785-1935. 42 pp. Philadelphia: Lea & Febiger.

The publishing house of Lea & Febiger so well known through its *American Journal of Medical Sciences* and its Gray's Anatomy presents an extremely interesting history. Its founding was made possible by a loan in 1785 from Lafayette to Mathew Carey, who confined its very early activities to general journalism. Included among its publishings at a later date were the original writings of Cooper, Irving and Poe. From 1859, however, all of its interests and efforts have been entirely medical. The coming of Osler to America and the later publishing of his system are among its accomplishments. Many of the leading medical texts and writings, as, for example, those of Cushny, Joslin and Mackee, bear the Lea & Febiger symbol. The sketch, though short, is quite illuminating and informative.

The Vitamin B Requirement of Man. George R. Cowgill. 261 pp. New Haven: Yale University Press. $4.00.

This book is written by probably the greatest authority in the field of vitamin B research. It recounts in simple and very readable English the num-

erous carefully controlled animal experiments which the author and his associates have made since 1921. The general problem of beriberi and the arguments for and against its classification as a disease due to deficiency in vitamin B are carefully and systematically recorded. All of the experimental and clinical observations regarding the beriberi are critically examined. Diets are analyzed for their vitamin B content and the minimal vitamin B contents of the human dietary are calculated according to a general formula derived from experimentation with various animals. A chapter of great interest to the modern clinician is that in which is discussed the relation of vitamin B to various clinical conditions such as anemia, anorexia, certain neurological conditions, etc. This chapter is, by its nature, frequently speculative and not wholly in keeping with the strictly scientific aspects of the remainder of the book. The bibliography is unusually complete and well documented. The printing is excellent. The book is valuable as a model of research and intelligent writing. It is highly recommended not alone for the students of vitamin B research, but for the forward-looking clinician and the worker in the field of diet and nutrition.

Mental Health, Past, Present and Future. Arthur Hiler Ruggles, M.D. 104 pp. The Colver Lectures, 1932. Published for Brown University, Providence, R. I., by The Williams & Wilkins Company, Baltimore, 1934.

This little book reviews briefly the history of our changing ideas regarding mental disease. There is much of interest, although nothing new is added to the history of the subject. Details are given, however, which are not easily found elsewhere, particularly in regard to the work of Miss Dix in the State of Rhode Island. A long extract is given from an important contribution by her, published in the *Providence Journal*, April 10, 1844, in which she describes a famous case of insanity in a man confined to a dungeon in Little Compton, Rhode Island. Although the article is not written over her own signature, there seems to be little doubt that she was the author. It was the history of this tragic case that Miss Dix presented to Mr. Cyrus Butler, a business man, who was so spellbound by her story that he gave a large sum of money immediately, which served as the foundation of the Butler Hospital in Providence.

Dr. Ruggles outlines what has happened in the ninety years since Miss Dix started a movement in this country, which ultimately reached wide proportions. Most of the material is well known and need not be reviewed here. Of more importance, however, is the third section of the book, which deals with mental health of the future. Dr. Ruggles believes that the important developments in the general field of medicine, such as the progressively better hospital care of patients and preventive measures, will be applied more definitely to the problem of mental disease in the future. Hospitals will be improved, staffs better trained, and the public will become more used to the care of patients with mental disease, just as they have become acquainted with the hospitalization of patients with other diseases. He presumes, also, that the more chronic cases will be segregated in colonies and possibly more of them will be boarded out under proper supervision. Along with this, the improvements made by scientific research will be applied to mental patients exactly as they are applied to patients in general hospitals. Finally, Dr. Ruggles points out that although the hospitalization of patients and their special care are necessary, the real problem in relation to mental disease lies in a consideration of more strictly preventive measures. Very little has been done to apply the knowledge, gained from a scientific study of breeding in animals, to the human race. "We must learn to breed up, and not down." Neurotic stock should not be bred with other neurotic stock. Better hygiene, both physical and mental, of the expectant parent, better obstetrics, more care in the early months of life by familiarity with the problems of nutrition, child guidance at an early age, and other matters are considered.

The problem is well considered and the conclusions well drawn. One feels that the book could be read profitably by a large section of the lay public and by considerable numbers of the medical profession.

Diabetic Manual for Patients. Henry J. John. Second Edition. 232 pp. St. Louis: The C. V. Mosby Company. $2.00.

This excellent manual will be helpful and interesting to any diabetic patient. In explaining the nature of diabetes the author stresses the central position of the islands of Langerhans. He considers that disease of these islands most commonly follows infections such as tonsillitis, or else develops as a result of obesity. Variations in the number or quality of the islands present at birth or due to inheritance he regards as of minor importance as compared with the precipitating factors. In relation to the marriage of a diabetic, however, he advises against a union with anyone in whose family the hereditary taint of diabetes is present. Perhaps such emphasis is most desirable in a teaching manual, yet it leaves almost without mention all the newer information of the interaction between the pituitary and the pancreas.

Excellent chapters upon the treatment of diabetes before and since insulin bring out the immensely improved outlook for the modern diabetic patient. The author's keen interest in diabetic children is apparent in his description of his diabetic camp near Cleveland, Camp Ho Mita Koda. Excellent sections upon measurement of the diet and the technique of insulin administration are followed by instruction in the prevention and treatment of coma, general hygiene and coöperation of physician and patient.

Nursing Schools Today and Tomorrow. Final Report of the Committee on the Grading of Nursing Schools. 268 pp. New York: The Nursing Information Bureau of the American Nurses' Schools. $2.00.

A Committee composed of representatives of the national nursing, medical and hospital associations with members at large representing educational foundations has completed its work after eight years of study. The original plan of the Committee was to grade schools of nursing to raise their educational standards. The Committee decided to make a broader interpretation of its functions so that eight years have been spent in a study of ways and means for insuring an ample supply of nursing service of whatever type and quality is needed for adequate care of the patient, at a price within his reach. We believe all interested in nursing will find this a valuable contribution to the subject, supplementing the first publication of the Committee, "Nurses, Patients, and Pocket Books" in 1928. The report gives its findings of the present nursing situation and makes recommendations for the future.

The Equilibrated Salt Diet. Robert Wollheim and Walter H. Schauinsland. 64 pp. New York: Professional Scientific Service.

This pamphlet, paper bound, purports to be a summary of present practice in substituting a balanced cation mixture for sodium chloride. It appears to the reviewer to be a subtle method of advertising "Titro Dietetic Salt" which is alleged to form an isotonic solution containing sodium, calcium, potassium, magnesium, chloride, lactate and citrate in proper proportions. So far as the reviewer is aware, any well-balanced diet will provide the proper supply of cations. Apparently the basis of this diet, which is recommended primarily for certain skin conditions, is that the use of our highly refined table salt fails to provide the proper mineral balance to offset the excess of sodium so ingested. The book is so general in its statements, that certainly no inaccuracies are apparent, but this virtue of generality fails to supply sufficient evidence to convince a skeptical reader as to the value of this method of treatment.

The Doctor in History. Howard W. Haggard, Associate Professor of Applied Physiology in Yale University. 408 pp. New Haven: Yale University Press. London: Humphrey Milford, Oxford University Press, 1934. $3.75.

The author of "Devils, Drugs and Doctors" has given his readers a second volume fully as fascinating and instructive as the above-mentioned work. Dr. Haggard has marshalled in the pages of this book a complete history of the physician, from the Cro-Magnon Medicine Man through the ages, including the modern physician and his accomplishments.

Sir James Jeans tells us in his new popular work on Astronomy, of the infinitesimal time of recorded history, compared with the age of the world, and the comparative split second of time since the Christian Era. On reading Dr. Haggard's book the reviewer is struck by this time simile, with regard to Medicine. The modern period since Lister and Pasteur revolutionized medicine by their epoch-making discoveries, some seventy-five years ago, seems short indeed, and the quick progress of these years, almost unbelievable, compared with the slow and painful evolution of the physician from the witch doctor of the Cro-Magnon Era, up to that time.

It is difficult to mention parts of this volume for particular praise, when all are so praiseworthy. Chapter IX, "The Way Divides — East and West," gives a masterly account of Medicine in the Byzantine Empire, and of the great Arab physicians. The influence of the western superstitions was still strong, however, and affected Medicine in the East, as the inimitable anecdote concerning Aetius given by Dr. Haggard shows:

"Aetius, physician to the Emperor Justinian I, prescribed as the best method of removing a bone from the throat, saying in a loud voice to the bone: 'As Jesus Christ drew Lazarus from the grave, and Jonah out of the whale, thus Blasius, the martyr and servant of God commands, "Bone come up or bone go down."' The author of these foolish words occupied the same position in the Roman Court of the East that Galen had held four hundred years before in Imperial Rome."

The illustrations of this volume form a complete pictorial review of the physician and his works, from the earliest times to the present. Seldom has a book been more happily illustrated.

The physician on perusing its pages will experience that sensation, rather difficult to express in words, which all book lovers know—a feeling of satisfaction, for a work so well done, and pride in the author's achievement.

A Textbook of Surgery. W. Wayne Babcock. Second Edition. 1312 pp. Philadelphia and London: W. B. Saunders Company. $10.00.

Dr. Babcock has achieved the remarkable feat of compressing the essential facts of surgery into one volume. This, the second edition, has been thoroughly revised to include all the important developments of the past seven years. New sections have been added on the parathyroid glands, the sympathetic nervous system, the duodenum, the mesentery and omentum, the epiphyses, and the malacias of bone. New operations have been added while obsolete ones have been dropped. More emphasis is given to pre- and postoperative management. These with innumerable other changes including the addition of one hundred and fifty new illustrations bring the book up to date. It should prove of great value not only to students but to practitioners of medicine or surgery as well.